B.Tech (Fashion Technology)

2018 Regulations, Curriculum & Syllabi

BANNARI AMMAN INSTITUTE OF TECHNOLOGY
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BANNARI AMMAN INSTITUTE OF TECHNOLOGY, SATHYAMANGALAM

REGULATIONS 2018

(CHOICE BASED CREDIT SYSTEM)

(Common to all B.E./B.Tech. Degree Programmes)

Regulation 2018 has been prepared in accordance with the guidelines given by the University Grants Commission, All India Council for Technical Education and affiliating University incorporating the features of the Choice Based Credit System (CBCS). The Regulation 2018 is applicable to the candidates admitted to the Bachelor of Engineering (B.E.) / Bachelor of Technology (B.Tech.) Degree Programmes of the Institution in the academic year 2018-2019 for Regular admission (Academic year 2019-2020 for Lateral Entry) and subsequently.

The regulations hereunder are subjected to amendments as may be decided by the Academic Council of the Institution from time to time. Any or all such amendments will be effective from such date and to such batches of students (including those already in the middle of the programme) as may be decided by the Academic Council.

1. ADMISSION

Candidate, seeking admission to the B.E./B.Tech. Programme, shall satisfy the conditions of admission prescribed by the Directorate of Technical Education and Anna University, Chennai as given below.

1.1 Regular Admission

Candidates, for admission to the first semester of the eight semesters B.E./B.Tech. Degree Programmes, shall be required to have passed:

- Higher Secondary Examination (10 +2) of curriculum (Regular Academic Stream) prescribed by the Government of Tamil Nadu with Mathematics, Physics, and Chemistry as three of the four subjects of the study prescribed under Part-III or any other examinations of any Board or University or authority accepted by the Syndicate of the University / Directorate of Technical Education (DoTE), Chennai as equivalent thereto.

(or)

- Should have passed Higher Secondary Examination of Vocational Stream (Engineering/Technology), prescribed by the Government of Tamil Nadu.

1.2 Lateral Entry Admission

1.2.1 The candidates who possess Diploma in Engineering / Technology awarded by the State Board of Technical Education and Training, Tamil Nadu or its equivalent are eligible to apply for Lateral Entry admission to the third semester of B.E. / B.Tech. Programmes in the branch of study as per the eligibility criteria prescribed by the Directorate of Technical Education from time to time.

(or)

1.2.2 The candidates who possess the Bachelor Degree in Science (B.Sc.) (10+2+3 stream) with Mathematics as a subject in B.Sc. is eligible to apply for Lateral Entry admission to the third semester of B.E./B.Tech. Programmes, as per the eligibility criteria prescribed by the Directorate of Technical Education from time to time. Such candidates shall undergo two additional Engineering subject(s) one each in third and fourth semesters, as bridge courses.

2. PROGRAMMES OFFERED

A candidate may be offered admission to any one of the programmes offered by the Institution for the candidates specified in Clause 1.1 and as per the eligibility criteria of DoTE for the candidates under Clause 1.2 from the list given below:

B. E. Programmes

i. Aeronautical Engineering
ii. Agricultural Engineering
iii. Automobile Engineering
iv. Civil Engineering
v. Computer Science and Engineering
vi. Electronics and Communication Engineering
vii. Electrical and Electronics Engineering
viii. Electronics and Instrumentation Engineering
ix. Mechanical Engineering
x. Mechatronics

B. Tech. Programmes

i. Biotechnology
ii. Fashion Technology
iii. Food Technology
iv. Information Technology
v. Textile Technology

3. STRUCTURE OF THE PROGRAMME

3.1 Every programme shall have a distinct curriculum with syllabi consisting of theory, laboratory, project, soft-skills and personality development courses, as prescribed by the respective Boards of Studies, broadly categorized under:

(i) **Basic Science** courses including Mathematics, Physics, Chemistry and further specialization in these subjects

(ii) **Basic Engineering** courses including Engineering Graphics, Engineering Practices, Basics of Electrical, Electronics, Civil, Mechanical Engineering, Engineering Mechanics and Computer Programming.

(iii) **Humanities and Social Science** courses including Language Courses, Management Courses, Soft Skills and Professional Ethics.

(iv) **Professional Courses** include Discipline Core Courses, Professional Electives, and Open Electives.

(v) **Employability Enhancement Courses (EEC)** includes Project Work and /or Internship, Seminar, Industrial /Practical Training, Value Added and Certificate Courses.

The medium of instruction is English for all the Courses, Examinations, Seminar Presentation, Projects and any other courses that a student registers for.

3.2 Each course is normally assigned a certain number of credits based on the following

Contact period per week	Credits
1 Lecture / 1 Tutorial period	1
2 laboratory Periods (Laboratory / Seminar / Project Work / etc.)	1

3.3 All the B.E. / B.Tech. Students will study Communicative English I during the First Semester. In the Second Semester, they will be divided into two streams based on their English language proficiency assessed in the Continuous Assessment during semester I, in which the upper segment will be provided an option to enroll and study Communicative English II / German / Japanese / French / Chinese / Hindi while the lower segment will study Communicative English II.

3.4 Every student shall be required to opt for **Nine** electives from the list of electives. Students can opt for the electives (Core / Professional) from his / her own discipline courses, during V to VIII Semesters, if he/she satisfies the prerequisite for that particular course.

3.5 However, out of nine electives, every student shall be required to opt for, a minimum of one and subject to a maximum of three courses as open elective from the list of electives of the branch / branches other than his / her branch of specialisation, if he/she satisfies the prerequisite for that particular course.

3.6 Students can also opt for **one-credit courses** of 15 to 20 hour duration, which will be offered by the experts from the industry on specialised topics. Students can opt for such **one-credit courses** during the semesters I to VII as and when these courses are offered. A student will also be permitted to register the **one-credit courses** offered by other Departments, provided the student has fulfilled the necessary pre-requisites or the courses that may not require any pre-requisites. Under no circumstances, the same one credit course shall be repeated in subsequent semesters in any Department / Centre for the same batch of the students and a maximum batch size for a given course shall not exceed 40. In case of disciplines with multiple divisions (intake more than 60) different course(s) shall be offered to other batch(es) of students.

On successful completion of one credit courses, Credits will be indicated in the Grade Sheet, but will not be considered for computing the Cumulative Grade Point Average (CGPA). However, if a student wishes to avail the exemption from any one of the Electives (other than open elective) of the Semester VIII, he / she can do so by exercising his / her option in writing to the respective Head of the Department during the beginning of the VIII Semester, following the equivalence norm, that one **regular elective** (in the **VIII Semester**) is equivalent to **three one-credit courses** completed by the student during the previous semesters, IV to VII. Details of the one credit courses offered by the department shall be forwarded to the Office of the Controller of Examinations. However one credit courses completed during I to III semesters shall be maintained in the Grade sheet as “Additional credits earned” (not considered for the computation of SGPA/CGPA).

3.7 A student can register for Self-Study Elective(s) over and above the electives from any branch of Engineering / Technology at the rate of one per semester starting from V semester onwards provided he/she maintains a Cumulative Grade Point Average (CGPA) of 8.50 or above till the previous semesters with no current arrears. Credits will be indicated for such courses in the grade sheets (additional credits) but will not be considered for computing the CGPA.

3.8 A Student may be permitted to credit only one online course with the approval of the Departmental Consultative Committee constituted by the Head of the Department, subject to a maximum of three credits. The student needs to obtain certification or credit to become eligible for writing the End Semester Examination to be conducted by the CoE. A student can get exemption for a maximum of 3 credits during the entire programme (in lieu of Core elective or Open elective). The Head of the Department may identify a faculty member as coordinator for the course, who is responsible for the evaluation process. The course shall be evaluated through the End Semester Examination only. The evaluation methodology may be decided by the course faculty coordinator.

3.9 Industrial Training / Internship

The students may undergo Industrial training / Internship optionally for a period as specified in the table during summer / winter vacation and the credits earned will be indicated in the Mark Sheet. If the student earns three credits in Industrial Training / Internship, the student may drop one Professional Elective. In such cases, Industrial Training / Internship need to be undergone continuously from one organization only. However, if the number of credits earned is 1 or 2, these credits shall not be considered for classification of the degree. The students may also undergo Internship at Research organization / University (after due approval from the Department Consultative Committee) during summer / winter vacation, in lieu of Industrial training.

Duration of Training / Internship	Credits
2 Weeks	1
1 Month	2
2 Months	3

3.10 Socially Relevant Projects

A Student may be permitted to carry out a socially relevant project during semester II to semester VI in consultation with the Faculty Guide and submit the project report, in the prescribed format, at the end of the Semester for the valuation.

On successful completion of socially relevant project work, one credit will be indicated in the grade sheet (Additional credits), but these credits will not be considered for computing the CGPA.

4. VALUE ADDED COURSES

A Student can opt for the Value Added Courses offered by the various Department / Centres from Semester II to VII. Head of the Department / Centre shall submit the list of such courses, duly approved / ratified by the Academic Council, to the Controller of Examinations to administer the examination process. A separate Certificate will be issued on successful completion of the course by the Office of the Controller of Examinations.

5. DURATION OF THE PROGRAMME

5.1 A regular student (admitted after 10+2) or equivalent is normally expected to satisfactorily fulfil the requirements for award of the degree B.E. / B.Tech. within four academic years (8 semesters) from the date of admission but in any case not more than 7 years (14 Semesters); lateral entry students shall fulfil such requirements within three academic years (6 semesters) from the date of admission but in any case not more than six years (12 Semesters) leading to the award of Degree of Bachelor of Engineering (B.E.) / Bachelor of Technology (B.Tech.) of Anna University, Chennai.

5.2 The total period for completion of the programme from the commencement of the semester, to which the student was admitted, shall not exceed the maximum period (Clause 5.1), regardless to the break-of-study (vide Clause 15) or period of prevention in order.

5.3 Each semester shall consist of minimum 90 working days. Head of the Department shall ensure that every faculty member teaches the subject / course as prescribed in the approved curriculum and syllabi.

5.4 Special Theory / Practical Sessions may be conducted for students who require additional inputs over and above the number of periods normally specified (Remedial Classes), as decided by the Head of the Department, within the specified duration of the Semester / Programme.

6. COURSE ENROLLMENT AND REGISTRATION

6.1 Each student, on admission shall be assigned to a Faculty Advisor (vide Clause 8) who shall advise / counsel the student about the details of the academic programme and the choice of course(s) considering the student's academic background and career objectives.

6.2 Every student shall enroll for the courses of the succeeding semester, in the current semester. However, the student shall confirm the enrollment by registering for the courses within the first five working days after the commencement of the semester concerned.

6.3 After registering for a course, a student shall attend the classes, satisfy the attendance requirements, earn Continuous Assessment marks and appear for the End Semester Examinations.

6.3.1 Each student, on admission to the programme, shall register for **all the courses prescribed in the curriculum** in the **first Semester of study (III Semester** for students admitted under **lateral entry stream).**

6.3.2 The enrollment for all the courses of the Semester II will commence 10 working days prior to the last working day of Semester I. The student shall confirm the enrollment by registering for the courses within the first five working days after the commencement of the Semester II. In case, if a student fails to register in course(s), he/ she may be permitted to register the same, as specified in the Clause 6.5, in the subsequent semesters or when it is offered.

6.3.3 The enrollment for the courses of the Semesters III to VIII will commence 10 working days prior to the last working day of the preceding semester. The student shall enroll for the courses with the guidance of the student's Faculty Advisor. If a student wishes, the student may drop or add courses (vide Clause 6.4) within **five** working days after the commencement of the

semester concerned and complete the registration process duly authorized by the Faculty Advisor.

6.4 Flexibility to Add or Drop courses

6.4.1 A student has to earn the total number of credits specified in the Curriculum of the respective Programme of study in order to be eligible to obtain the degree. However, if a student wishes, the student is permitted to earn more than the total number of credits prescribed in the curriculum by opting for one- credit courses, self study electives or additional courses.

6.4.2 From the III to VIII semesters (from IV to VIII Semesters in case of lateral entry students), the student has the option of registering for additional courses or dropping existing courses. The total number of credits that a student can add or drop is limited to 8, subject to a maximum of 2 courses in a given Semester. In such cases, the attendance requirement as stated in Clause 7 is mandatory.

6.4.3 The student shall register Project work I in semester VII and Project work II in semester VIII only.

6.5 Reappearance Registration

6.5.1 If a student fails in a theory course, the student shall do reappearance registration (Examination) for that course in the subsequent semesters or when it is offered next.

6.5.2 On registration, a student may attend the classes for the reappearance registration courses, if the student wishes, and the attendance requirement (vide Clause 7) is not compulsory for such courses.

6.5.3 However, if a student wishes to improve his/ her continuous assessment, in the second attempt during reappearance, he/she shall satisfy the Clause 6.5.5 and appear for continuous assessment as given for that particular course.

6.5.4 If the theory course, in which the student has failed, is either a professional elective or an open elective, the student may register for the same or any other professional elective or open elective course, respectively in the subsequent semesters. However, the change of elective courses is permitted only once.

6.5.5 In this case (Clause 6.5.4), the student shall attend the classes, satisfy the attendance requirements (vide Clause 7), earn Continuous Assessment marks and appear for the End Semester Examination.

6.5.6 The student who fails in any continuous assessment courses (Laboratory/ Project work / Seminar or any other HSS/EEC courses) shall register for the same in the subsequent semesters or when offered next, and **repeat** the course as per Clause 6.5.5.

6.5.7 If a student is prevented from writing the end semester examination of a course or several courses due to lack of attendance, the student has to register for that / those course(s) again, when offered next, attend the classes and fulfill the requirements as per Clause 6.5.5 & 6.5.6. If the course, in which the student has 'lack of attendance', is a Core Elective or an Open Elective, the student may register for the same or any other Core Elective or Open Elective course(s) respectively in the subsequent semesters and appear in the examination as per Clause 6.5.5.

6.5.8 If a student fails to secure a pass in any theory courses (including elective) he/she is given a maximum of three arrear attempts to complete the courses. If the student still fails to secure a pass, he/she shall register for the same when offered next and repeat the course.

7. REQUIREMENTS FOR APPEARING FOR THE END SEMESTER EXAMINATION OF A COURSE

A student who has fulfilled the following conditions (vide Clause 7.1 and 7.2) shall be deemed to have satisfied the attendance requirements for appearing for End Semester Examination of a particular course.

7.1 Every student is expected to attend all the periods and earn 100% attendance. However, a student shall secure not less than 80% attendance course wise taking into account the number of periods required for that course as specified in the curriculum.

7.2 If a student, secures attendance between 70% and 79% in any course(s) in the current semester due to medical reasons (prolonged hospitalization / accident / specific illness) or participation in Institution/ University/ State/ National/

International level extra and co-curricular activities, with prior permission from the Head of the Department, shall be permitted to appear for the current semester examinations subject to the condition that the student shall submit the medical certificate / participation certificate attested by the Head of the Department (along with Condonation form). Such certificates along with the condonation forms shall be forwarded to the Controller of Examinations for verification and permission to attend the examinations. However during the entire programme of study, a student can avail such Condonation in any two semesters only (regardless the number of courses).

7.3 A student shall normally be permitted to appear for End Semester Examination of the course(s) if the student has satisfied the attendance requirements (vide Clause 7.1 – 7.2) and has registered for examination in those courses of that semester by paying the prescribed fee.

7.4 Students who do not satisfy Clause 7.1 and 7.2 and who secure less than 70% attendance in a course will not be permitted to write the End-Semester Examination of that course. The student has to register and repeat this course in the subsequent semesters or when it is offered next (vide Clause 6.5).

7.5 If a student has shortage of attendance in all the registered courses, he/she would not be permitted to move to the higher semester and has to repeat the current semester in the subsequent year.

7.6 In the case of reappearance (Arrear) registration for a course, the attendance requirement as mentioned in Clauses 7.1 - 7.3 is not applicable. However, the student has to register for examination in that course by paying the prescribed fee.

7.7 A student who has already appeared for a course in a semester and passed the examination is not entitled to reappear in the same course for improvement of grades.

8. FACULTY ADVISOR

To help the students in planning their courses of study and for general advice on the academic programme, the Head of the Department will attach a certain number of students to a Faculty member of the Department who shall function as Faculty Advisor

for those students. The Faculty Advisor shall advise and guide the students in registering of courses, reappearance of courses, monitor their attendance and progress and counsel them periodically. The Faculty Advisor also discusses with or informs the parents about the progress / performance of the students concerned.

The responsibilities of the faculty advisor shall be:

- To inform the students about the various facilities and activities available to enhance the student's curricular and co-curricular activities.
- To guide student enrollment and registration of the courses.
- To authorize the final registration of the courses at the beginning of each semester.
- To monitor the academic and general performance of the students including attendance and to counsel them accordingly.

9. COMMITTEES

9.1 Common Course Committee

9.1.1 A theory course handled by more than one faculty including the discipline with multiple divisions (greater than or equal to 2) shall have a "Common Course Committee" comprising of all members of faculty teaching that course with one of the members as the Course Coordinator, nominated by the Head of the Institution (Head of the Department in the case of multiple divisions of a discipline) and student representatives (one per specialization or division) registered for that course in the current semester.

First meeting of the Common Course Committee shall be held within fifteen days from the date of commencement of the semester. Two subsequent meetings in a semester may be held at suitable intervals. During these meetings, the student members shall meaningfully interact and express their opinions and suggestions of all the students to improve the effectiveness of the teaching-learning process. It is the responsibility of the student representatives to convey the proceedings of these meetings to all the students.

9.1.2 In addition, Common Course Committee (without the student representatives) shall meet to ensure uniform evaluation through the common question papers during Continuous Assessment and End Semester Examinations.

9.2 Class Committee Meeting

For all the courses taught, prescribed in the curriculum, Class Committee meeting shall be convened thrice in a semester (first meeting within 15 days from the commencement of the semester and other two meetings at equal interval after the first meeting) comprising members of the faculty handling all the courses and two student representatives from the class.

One of the members of the faculty (preferably not handling any courses to that class), nominated by the Head of the Department, shall coordinate the activities of the Committee. During these meetings, the student members shall meaningfully interact and express their opinions and suggestions of all the students to improve the effectiveness of the teaching-learning process. It is the responsibility of the student representatives to convey the proceedings of these meetings to all other students.

10. SYSTEM OF EXAMINATION

10.1 Performance in each course of study shall be evaluated based on (i) Continuous Assessment throughout the semester and (ii) End Semester examination at the end of the semester for the regular courses or as given in the Clause 16. However, the final examination in the case of certificate / value added courses may be conducted, as and when the course is completed, through the office of the Controller of Examinations.

10.2 Each course, both theory and laboratory including project work, shall be evaluated as per the Scheme of Assessment given in Clause 16.

10.3 The End Semester Examinations shall normally be conducted after satisfying the Clause 5.2.

10.4 For the End Semester examinations, both theory and project work, the internal and external examiners (from Academia or Industry) shall be appointed by the Controller of Examinations as per the guidelines given by the Examination cum Evaluation committee of the Institute.

11. PASSING REQUIREMENTS AND PROVISIONS

11.1 The Passing requirement for a student in a course is determined based on the marks obtained both in Continuous Assessment and End Semester Examinations. If the student gets <50% of marks in End Semester Examination, then the student will be awarded only RA (Reappearance) grade.

11.1.1 If a student fails to secure a pass in a particular course, i.e., failing to obtain minimum marks, as stated above, it is mandatory that he/she shall reappear for the examination in that course in the subsequent semester(s) whenever the examinations are conducted for that course, till he / she secures a 'Pass'.

Continuous Assessment (CA) marks obtained by the student in the first appearance shall be retained and considered valid for one subsequent attempt, except Clause 6.5.4, 6.5.5, 6.5.6 and 6.5.7. However, from the third attempt onwards, the student shall be declared to have passed the course if he/she secures a minimum of 6 Grade Points (B Grade) in the course prescribed during the End Semester Examinations.

11.2 If a candidate fails in the seventh semester examinations of Project work I, he/she has to resubmit the Project Report within 30 days from the date of declaration of the results. If he / she fails in the End semester examination of Project work II, he/she shall resubmit the Project Report within 60 days from the date of declaration of the results. The resubmission of the project report and the subsequent viva-voce examination will be considered as reappearance with payment of exam fee. In case a student fails in the resubmission of a project report and subsequent viva-voce examination, the student shall register for the course again, when offered next.

11.3 The passing requirement for the courses which are assessed only through continuous assessment (Laboratory and EEC courses except project work), shall be fixed as minimum 50% and the remaining grades are decided as per clause 12.4. If a candidate fails in EEC courses (Except Project work), he/she has to register and repeat the course within 30 days from the date of declaration of the

results. In case a student fails to register within 30 days, he/she shall register for the course again, when offered next.

11.4 The minimum number of total credits to be earned by a student to qualify for the award of Degree in the various branches of study as prescribed by the respective Boards of Studies is given below:

Branch of Study	Minimum Credits	
	Regular Admission	Lateral Entry
B.E. Programmes		
Aeronautical Engineering	172	135
Agricultural Engineering	172	134
Automobile Engineering	170	133
Civil Engineering	171	133
Computer Science and Engineering	171	133
Electronics and Communication Engineering	172	131
Electrical and Electronics Engineering	170	131
Electronics and Instrumentation Engineering	170	131
Mechanical Engineering	170	131
Mechatronics	170	132
B.Tech. Programmes		
Biotechnology	172	134
Fashion Technology	172	134
Food Technology	170	132
Information Technology	170	132
Textile Technology	171	133

11.5 Student Migration and Credit Transfer: Normalization of the Credits will be carried out in consultation with the Board of Studies of the programme concerned and approved by the Head of Institution, if a student migrates from other Autonomous institutions to Bannari Amman Institution of Technology or rejoins from previous regulation to this regulation.

11.6 A student shall be declared to have qualified for award of B.E/B.Tech. Degree if he/she successfully completes the course requirements (vide Clause 7, 10 and 11) and passed all the prescribed courses of study of the respective programme (listed in Clause 2), within the duration specified in Clause 5.1.

12. ASSESSMENT AND AWARD OF LETTER GRADES

12.1 The assessment shall be based on the performance in the End Semester Examinations and / or Continuous Assessment, carrying marks as specified in Clause 16. Letter Grades (based on Credit Point and Grade Point) are awarded to the students based on the performance in the evaluation process.

12.2 Credit Point is the product of Grade Point and number of credits for a course and Grade Point is a numerical weight allotted to each letter grade on a 10-point scale (as specified in the Clause 12.4), while the Letter Grade is an index of the performance of a student in a said course.

12.3 Condition for Relative Grading

The minimum number of students for applying relative grading system is 30. If the students' strength is less than 30 then absolute grading system will be applied. The relative grading system shall not be applied for laboratory and EEC courses.

12.4 The performance of a student will be reported using Letter Grades in absolute grading, each carrying certain points as detailed below: In relative grading, grades will be decided by the faculty concerned. A student who earns a minimum of 6 grade points in a course is declared to have successfully passed the course.

Range of Total Marks (as specified in Clause 16) / Specific Reason	**Grade Points**	**Letter Grade**
91 to 100	10	O (Outstanding)
81 to 90	9	A + (Excellent)
71 to 80	8	A (Very Good)
61 to 70	7	B + (Good)
50 to 60	6	B (Above average)
0 to 49	0	RA (Reappearance Registration)
Incomplete	0	I
Withdrawal	0	W
Absent	0	AB
Shortage of Attendance	0	SA

'RA' ---Reappearance registration is required for that particular course

'I' --- Continuous evaluation is required for that particular course in the subsequent examinations.

'SA' --- shortage of attendance (Clause 7) and hence prevented from writing end semester examination.

12.5 After completion of the evaluation process, Semester Grade Point Average (SGPA), and the Cumulative Grade Point Average (CGPA) is calculated using the formula:

$$SGPA/CGPA = \frac{\sum_{1}^{n} C_i * g_i}{\sum_{1}^{n} C_i}$$

Where

C_i : Credit allotted to the course.

g_i : Grade Point secured corresponding to the course.

n : number of courses successfully cleared during the particular semester in the case of SGPA and all the semesters, under consideration, in the case CGPA.

12.6 A student who does not appear for the End Semester Examinations in a course, after registering for the same, shall be deemed to have appeared for that examination for the purpose of classification (Subject to Clause 14 and 15).

12.7 For the non credit courses grades shall be indicated as given in the Clause 16 and shall not be counted for the computation of SGPA/CGPA.

For the Co-curricular activities such as NCC / NSS / NSO / YRC, a satisfactory / not satisfactory grading will appear in the mark sheet. Every student shall put in a minimum of 75% attendance in the training and attend the camp compulsorily. The training and camp shall be completed during the first year of the programme. However, for valid reasons, the Head of the Institution may permit a student to complete this requirement in the second year. A satisfactory grade in the above co-curricular activities is compulsory for the award of degree.

12.8 **Revaluation:** A student, who seeks the re-valuation of the answer script, is directed to apply through proper application to the Controller of Examinations in the prescribed format through the Head of the Department. The Controller of Examinations shall arrange for the revaluation and declare the results. Revaluation is not permitted to the courses other than theory courses. In the case of theory courses with laboratory component, a student can seek revaluation for the theory component only, following the procedure stated above.

12.9 **Supplementary Examinations**: If a student fails to secure a pass in theory course(s) of VIII semester examination, he/she is eligible to appear for a one time Supplementary Examination which shall be conducted at the end of VIII semester, for the subjects of VIII semester alone within 30 days from the date of declaration of the results.

12.10 Eligibility for the Award of Degree

A student shall be declared to be eligible for the award of the B.E. / B.Tech. Degree provided the student has

i. Successfully gained the required number of total credits as specified in the curriculum corresponding to the student's programme within the stipulated time.
ii. Successfully completed the course requirements, appeared for the End-Semester examinations and passed all the courses prescribed in all the 8 semesters within a maximum period of 7 years reckoned from the commencement of the first semester to which the candidate was admitted.
iii. Successfully completed the NCC / NSS / NSO / YRC / Extra-curricular/ Co-curricular requirements.
iv. No disciplinary action is pending against the student.
v. The award of Degree must have been approved by the Syndicate of the University.

13. CLASSIFICATION OF THE DEGREE AWARDED

For the purpose of the 'Award of Degree', the duration of completion of the programme shall be the total duration taken by a student for completing first time registration of all the required courses and satisfying Clause 11, regardless to the period of Break-of-study as per Clause 15 and satisfy any one of the conditions required as given below.

13.1 **First Class with Distinction**: A student who satisfies the following conditions shall be declared to have passed the examination in **First class with Distinction**:

- Should have passed the examination in all the courses of all the eight semesters (six semesters for lateral entry students) in the student's First Appearance within five years, which includes authorized break of study of one year. Withdrawal from examination (vide Clause 15) will not be considered as an appearance.
- Should have secured a CGPA of **not less than 8.50**
- Should **NOT** have been prevented from writing end semester examination due to lack of attendance in any of the courses.

13.2 **First Class**: A student who satisfies the following conditions shall be declared to have passed the examination in **First class**:

- Should have passed the examination in all the courses of all eight semesters (six semesters for lateral entry students) within five years, which includes one year of authorized break of study (if availed) or prevention from writing the End Semester Examination due to lack of attendance (if applicable).
- Should have secured a CGPA of **not less than 7.00**

13.3 Second Class: All other students (not covered in clauses 13.1 and 13.2) who qualify for the award of the degree shall be declared to have passed the examination in **Second Class.**

14. WITHDRAWAL FROM THE EXAMINATION

14.1 A student may, for valid reasons, be granted permission by the Head of the Department to withdraw from appearing in the examination in any course(s) only once during the entire duration of the degree programme.

14.2 Withdrawal application shall be valid only, if the student is eligible to write the examination as per Clause 7 and, if it is made within TEN working days before the commencement of the end semester examination in that course or courses and also recommended by the Head of the Department.

14.3 Notwithstanding the requirement of mandatory TEN working days' notice, applications for withdrawal for special cases under extraordinary conditions will be considered on the merit of the case.

14.4 If a student withdraws a course or courses from writing end semester examinations, he/she shall register the same in the subsequent semester and write the end semester examination(s).

14.5 Withdrawal shall not be considered as an appearance in the examination for the eligibility of a student for First Class with Distinction or First Class.

14.6 Withdrawal is permitted for the end semester examinations in the final semester, only if the period of study of the student concerned does not exceed 5 years as per clause 13.1 & 13.2.

15. AUTHORIZED BREAK OF STUDY FROM A PROGRAMME

15.1 A student is permitted to go on break of study for a fixed period of one year as a single break in the entire course of study.

15.2 A student is normally not permitted to break the period of study temporarily. However, if a student happens to discontinue the programme temporarily during the middle of programme of study, for reasons such as personal accident or hospitalization due to ill health or in need of health care, he/she shall apply to the Head of the Institution in advance, in any case, not later than the last date for registering for the semester examination, through the Head of the Department stating the reasons for the break-of-study (for one academic semester or 6 months, whichever is earlier). However, a student detained for want of minimum attendance

requirement as per Clause 7 shall not be considered as permitted 'Break of Study' and Clause 15.3 is not applicable for such case.

15.3 The student is permitted to rejoin the programme after the break / prevention due to lack of attendance, shall be governed by the Curriculum and Regulations in force at the time of rejoining. The students rejoining in new Regulations shall apply to the Dean Academics in the prescribed format through the Head of the Department at the beginning of the readmitted semester itself for prescribing additional/equivalent courses, if any, from any semester of the regulations in-force, so as to bridge the curriculum in-force and the old curriculum.

15.4 Authorized break of study will be counted towards the duration specified for passing all the courses (vide Clause 5.1 and 5.2) and for the purpose of classification of Degree (vide Clause 13).

15.5 The total period for completion of the programme reckoned from the commencement of the first semester to which the student is admitted shall not exceed the maximum period specified in Clause 5.1, irrespective of the period of break of study in order that he / she may be eligible, for the award of the degree (vide Clause 13).

15.6 In case of valid reasons (as stated in Clause 15.2) extended break-of-study may be granted by the Head of the Institution for a period not more than one year in addition to the earlier authorized break of study.

15.7 If a student does not report back to the Institute, even after the extended Break of Study, the name of the student shall be deleted permanently from the college enrollment. Such students are not entitled to seek readmission under any circumstances.

16. SCHEME OF ASSESSMENT

Courses offered under B.E. / B.Tech. Programmes are assessed as given below:

I	**THEORY COURSES**	**Marks**
	Continuous Assessment	**50**
	Distribution of marks for Continuous Assessment:	
	Periodical Test I (10)	
	Periodical Test II (10)	
	Innovative Practices (30)	
	End Semester Examination	**50**
	Total Marks	**100**

II	**THEORY COURSES WITH LAB COMPONENT**	**Marks**
	Continuous Assessment	**50**
	Distribution of marks for Continuous Assessment:	
	Periodical Test I (10)	
	Periodical Test II (10)	
	Innovative Practices (30)	
	(Laboratory Assessment & Report)	
	End Semester Examination (QP pattern as per (I))	**50**
	Total Marks	**100**

III	**LABORATORY COURSES**	**Marks**
	Continuous Assessment	**100**
	Distribution of marks for Continuous Assessment:	
	Conduct of Experiment	
	i. Preparation (20)	
	ii. Experiment and Analysis of Results (20)	
	iii. Record (10)	
	Test – Cycle I (25)	
	Test – Cycle II (25)	
	Total Marks	**100**

IV	**PROJECT WORK I**	**Marks**
	Continuous Assessment	**50**
	Distribution of marks for Continuous Assessment:	
	<u>Review I</u>	
	Literature Survey (5)	
	Identification of topic and Justification (5)	
	Work plan (10)	
	<u>Review II</u>	
	Approach & Results (15)	
	Conclusion (15)	

End Semester Examination	**50**
Report[#] (20)	
Presentation (20)	
Viva voce (10)	
Total Marks	**100**

V	**PROJECT WORK II**	**Marks**
	Continuous Assessment	**50**
	Distribution of marks for Continuous Assessment:	
	Review I	
	Progress (10)	
	Review II	
	Approach & Results (10)	
	Review III	
	Conclusion & Final Presentation (10)	
	Report (15)	
	Publication of Paper in Conferences / Journals (5)	
	End Semester Examination	
	Presentation (30)	**50**
	Viva voce (20)	
	Total Marks	**100**

VI	**LANGUAGE ELECTIVE (CONTINUOUS ASSESSMENT ONLY)**	**Marks**
	Test 1	
	Listening (5)	
	Speaking (10)	**25**
	Reading (5)	
	Writing (5)	
	Test 2	
	Listening (5)	
	Speaking (10)	**25**
	Reading (5)	
	Writing (5)	
	Oral Exam	**50**
	Total Marks	**100**

VII	**ONE-CREDIT COURSE (CONTINUOUS ASSESSMENT ONLY)**	**Marks**
	Test I	**50**
	Quiz/ Assignment	**50**
	Total Marks	**100**

[#] *Reports / Record Note / Integrated Lab Manual to be retained for 1 year for Academic Audit, by respective Department*

VIII	**INDUSTRIAL TRAINING/ INTERNSHIP (CONTINUOUS ASSESSMENT ONLY)**	**Marks**
	Assessment by Industry	**30**
	Viva-voce	**20**
	Presentation	**30**
	Case Study / Report	**20**
	Total Marks	**100**

IX	**SOFT SKILLS (CONTINUOUS ASSESSMENT ONLY)**	**Marks**
	Test I	**25**
	Test II	**25**
	Final Examination	**50**
	Total Marks	**100**
	Grades (Excellent / Good / Satisfactory)	

X	**VALUE ADDED / CERTIFICATE COURSES (CONTINUOUS ASSESSMENT ONLY)**	**Marks**
	Test I	**25**
	Test II	**25**
	Final Evaluation / Test	**50**
	Total Marks	**100**
	Grades (Excellent / Good / Satisfactory)	

XI	**ENGINEERING GRAPHICS**	**Marks**
	Continuous Assessment	**100**
	Distribution of marks for Continuous Assessment:	
	Exercise (Minimum 10 Exercises/Modelling)	**60**
	Model Examination	**40**
	Total Marks	**100**

Optional Test: *A student becomes eligible to appear for an optional test conducted after the Periodical Test II, only under the following circumstances: (i) absent for Test I or Test II or both on account of medical reasons (hospitalization / accident / specific illness), or (ii) participation in the College / University / State / National / International level Sports events with prior permission from the Head of the Institution and (iii) on satisfying the conditions (i) or (ii), the student should have registered for the Optional Test, through the concerned member of faculty who handles the course or through the respective Head of the Department, submitted to the Controller of Examinations. Such Optional Tests are not conducted for the courses under the categories III, IV, V, VI, VII, VIII, IX, X and XI listed above.*

17. FIELD / INDUSTRIAL VISIT / INTERNSHIP

In order to provide the experiential learning to the students, Head of the Department shall take efforts to arrange at least two industrial visits / field visits. The students may also undergo in-plant training / internship during summer / winter vacation between III and VII semesters.

18. PERSONALITY AND CHARACTER DEVELOPMENT

Every student shall be required to undergo a minimum of 40 hours of Personality Development Programmes viz, NSS / NCC / YRC / YOGA / Sports and Games / Technical and Non-technical Club activities during the first year. The attendance of the personality and character development courses / events shall be maintained on the regular basis by the concerned First Year Co-ordinators and made available in the Office of the Controller of Examinations before the commencement of Semester examinations of Semester I or Semester II.

19. DISCIPLINE

A student is expected to follow the rules and regulations laid down by the Institute and the affiliating University, as published from time to time. Any violations, if any, shall be treated as per the procedures stated thereof.

If a student indulges in malpractice in any of the End Semester / Continuous Assessments, he / she shall be liable for punitive action as prescribed by the Institution / University from time to time.

20. REVISION OF REGULATIONS, CURRICULUM AND SYLLABI

The Institution reserves the right to revise/amend/change the Regulations, Curriculum, Syllabi, Scheme of Examinations and date of implementation and to introduce Additional Electives, Open Electives, One Credit Courses and Value Added Courses through the Academic Council.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

On successful completion of four year B.Tech degree programme quite a few years after graduation our graduates will

PEO1 : Graduates will be having successful careers in industry, academics and research in the fields of Apparel technology and fashion design with a fundamental knowledge and skill in basics of science, technology, arts, mathematics, computers and apparel manufacturing processes.

PEO2 : Graduates will be globally competent in fashion industry project management and entrepreneurship through effective communication, design and technology skills and also be able to appraise social and environmental issues.

PEO3 : Graduates will demonstrate spirit of ethics, leadership and engage in professional practice throughout their career.

PROGRAM O UTCOMES (POs)

Engineering Graduates will be able to:

a. **Engineering Knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. **Problem Analysis**: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineeringsciences.

c. **Design/ Development of Solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

d. **Conduct Investigations of Complex Problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

e. **Modern Tool Usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

f. **The Engineer and Society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

g. **Environment and Sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

h. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

i. **Individual and Team Work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinarysettings.

j. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

k. **Project Management and Finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

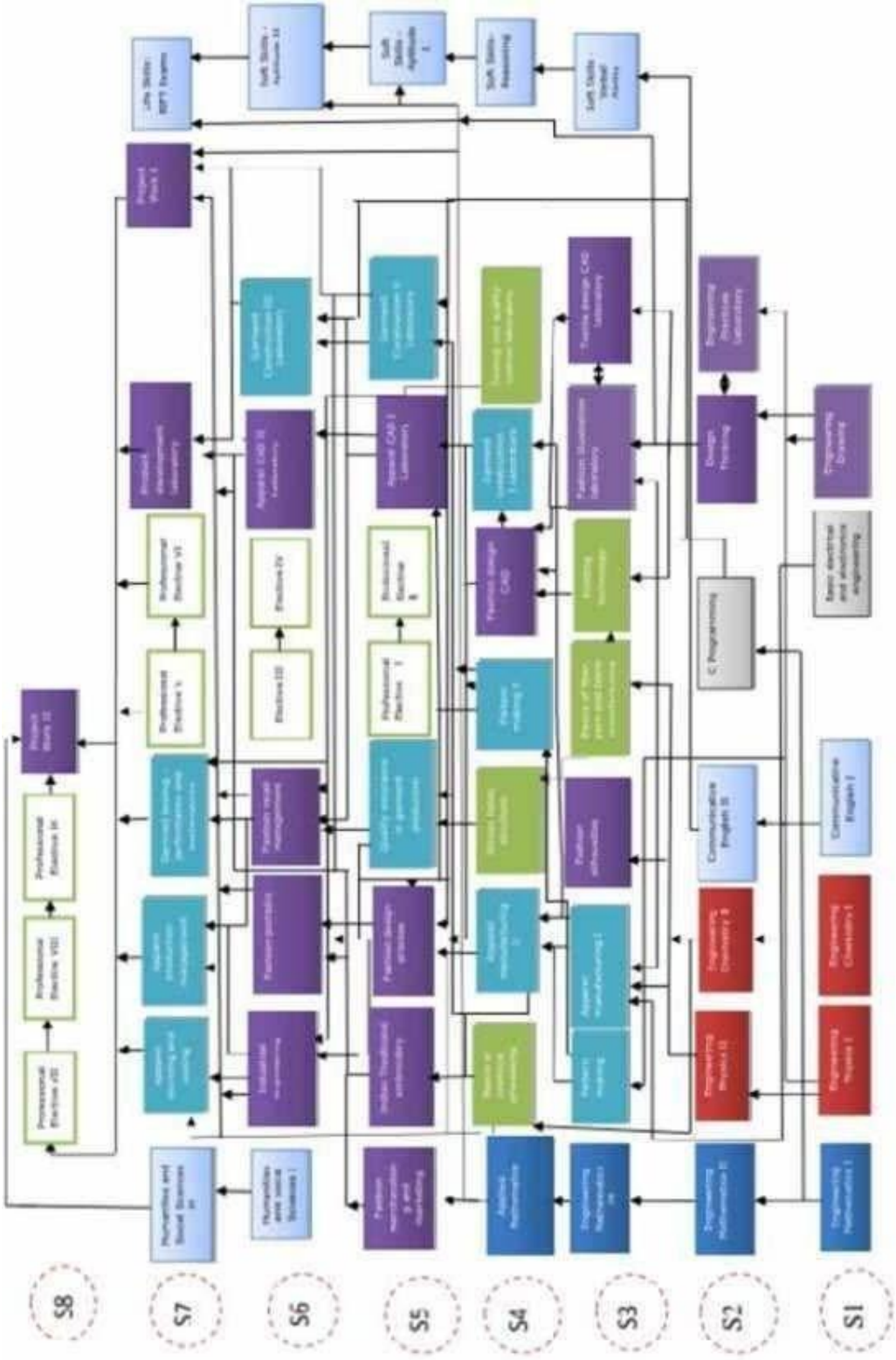
l. **Life-long Learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM S PECIFI C OUTCOMES (PSO's)

1. **Understand and incorporate:** Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
2. **Articulate, collaborate and solve:** Articulate design aesthetics, communicate product value s, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

MAPPING OF PEOs AND POs

	Programme educational objectives	**PO's**
(I) PEO 1	Graduates will be having successful careers in industry, academics and research in the fields of Apparel technology and Fashion design with a fundamental knowledge and skill in basics of science, technology, arts, mathematics, computers and apparel manufacturing processes.	a, b, c, d, e, g, k, l, m
(II) PEO 2	Graduates will be globally competent in fashion industry project management and entrepreneurship through effective communication, design and technology skills and also be able to appraise social and environmental issues.	c, f, g, h, i, j, l, n
(III) PEO 3	Graduates will demonstrate spirit of ethics, leadership and engage in professional practice throughout their career.	c, d, f, g, h, i, j, k, l


S8
S7
S6
S5
S4
S3
S2
S1

DEPARTMENT OF FASHIONTECHNOLOGY
Minimum Credits to be Earned : 172

I SEMESTER

Code No.	Course	L	T	P	C	Hours/ Week	Maximum Marks			Category
							CA	ES	Total	
18FT101	ENGINEERING MATHEMATICS I	3	1	0	4	5	50	50	100	BS
18FT102	ENGINEERING PHYSICS I	2	0	2	3	4	50	50	100	BS
18FT103	ENGINEERING CHEMISTRY I	2	0	2	3	4	50	50	100	BS
18FT104	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	2	0	2	3	4	50	50	100	ES
18HS101	COMMUNICATIVE ENGLISH I	1	0	2	2	3	100	0	100	HS
18FT106	ENGINEERING DRAWING	1	0	4	3	5	100	0	100	ES
Total		**11**	**1**	**12**	**18**	**25**	**400**	**200**	**600**	**-**

II SEMESTER

Code No.	Course	L	T	P	C	Hours/ Week	Maximum Marks			Category
							CA	ES	Total	
18FT201	ENGINEERING MATHEMATICS II	3	1	0	4	4	50	50	100	BS
18FT202	ENGINEERING PHYSICS II	2	0	2	3	4	50	50	100	BS
18FT203	ENGINEERING CHEMISTRY II	2	0	2	3	4	50	50	100	BS
18FT204	C PROGRAMMING	2	0	2	3	4	50	50	100	ES
	LANGUAGE ELECTIVE	1	0	2	2	3	100	0	100	HS
18FT206	DESIGN THINKING	2	0	2	3	4	50	50	100	ES
18FT207	ENGINEERING PRACTICES LABORATORY	0	0	4	2	4	100	0	100	ES
Total		**12**	**1**	**14**	**20**	**27**	**450**	**250**	**700**	**-**

III SEMESTER

Code No.	Course	L	T	P	C	Hours/ Week	Maximum Marks			Category
							CA	ES	Total	
18FT301	ENGINEERING MATHEMATICS III	3	1	0	4	4	50	50	100	BS
18FT 302	PATTERN MAKING I	2	0	2	3	4	50	50	100	PC
18FT 303	APPAREL MANUFACTURING I	2	0	2	3	4	50	50	100	PC
18FT 304	FASHION SILHOUETTES	2	0	2	3	4	50	50	100	PC
18FT 305	BASICS OF FIBER, YARN AND FABRIC MANUFACTURING	3	0	0	3	3	50	50	100	PC
18FT 306	KNITTING TECHNOLOGY	3	0	0	3	3	50	50	100	PC
18FT 307	FASHION ILLUSTRATION LABORATORY	0	0	4	2	4	100	0	100	PC
18FT 308	TEXTILE DESIGN CAD LABORATORY	0	0	4	2	4	100	0	100	PC
18GE301	SOFT SKILLS - VERBAL ABILITY	2	0	0	0	2	100	0	100	EEC
Total		**15**	**1**	**16**	**23**	**32**	**600**	**300**	**900**	**-**

IV SEMESTER										
Code No.	**Course**	**L**	**T**	**P**	**C**	**Hours/ Week**	**Maximum Marks**			**Category**
							CA	**ES**	**Total**	
18FT401	APPLIED MATHEMATICS	2	1	0	3	3	50	50	100	ES
18FT402	BASICS OF CHEMICAL PROCESSING	3	0	2	4	5	50	50	100	PC
18FT403	APPAREL MANUFACTURING II	2	0	2	3	4	50	50	100	PC
18FT404	WOVEN FABRIC STRUCTURE	2	0	2	3	4	50	50	100	PC
18FT405	PATTERN MAKING II	3	0	2	4	5	50	50	100	PC
18FT406	FASHION DESIGN CAD	2	0	2	3	4	50	50	100	PC
18FT407	GARMENT CONSTRUCTION I LABORATORY	0	0	4	2	4	100	0	100	PC
18FT408	TESTING AND QUALITY CONTROL LABORATORY	0	0	4	2	4	100	0	100	PC
18HS001	ENVIRONMENTAL SCIENCE	2	0	0	-	2	100	0	100	HS
18GE401	SOFT SKILLS – BUSINESS ENGLISH	2	0	0	-	2	100	0	100	EEC
Total		**16**	**1**	**20**	**24**	**37**	**700**	**300**	**1000**	**-**
V SEMESTER										
Code No.	**Course**	**L**	**T**	**P**	**C**	**Hours/ Week**	**Maximum Marks**			**Category**
							CA	**ES**	**Total**	
18FT501	FASHION MERCHANDISING AND MARKETING	3	0	0	3	3	50	50	100	PC
18FT502	INDIAN TRADITIONAL EMBROIDERY	3	0	2	4	4	50	50	100	PC
18FT503	FASHION DESIGN PROCESS	3	0	2	4	4	50	50	100	PC
18FT504	QUALITY ASSURANCE IN GARMENT PRODUCTION	3	0	0	3	3	50	50	100	PC
	PROFESSIONAL ELECTIVE I	3	0	0	3	3	50	50	100	PE
	PROFESSIONAL ELECTIVE II	3	0	0	3	3	50	50	100	PE
18FT507	APPAREL CAD I LABORATORY	0	0	4	2	4	100	0	100	PC
18FT508	GARMENT CONSTRUCTION II LABORATORY	0	0	4	2	4	100	0	100	PC
18GE501	SOFT SKILLS - APTITUDE I	0	0	2	-	2	100	0	100	EEC
Total		**18**	**0**	**14**	**24**	**32**	**600**	**300**	**900**	**-**
VI SEMESTER										
Code No.	**Course**	**L**	**T**	**P**	**C**	**Hours/ Week**	**Maximum Marks**			**Category**
							CA	**ES**	**Total**	
18HS002	PROFESSIONAL ETHICS IN ENGINEERING	2	0	0	2	2	50	50	100	HS
18FT602	INDUSTRIAL ENGINEERING	3	0	2	4	4	50	50	100	PC
18FT603	FASHION PORTFOLIO	2	0	2	3	5	50	50	100	PC

18FT604	FASHION RETAIL MANAGEMENT	3	0	0	3	3	50	50	100	PC
	PROFESSIONAL ELECTIVE III	3	0	0	3	3	50	50	100	PE
	PROFESSIONAL ELECTIVE IV	3	0	0	3	3	50	50	100	PE
18FT607	APPAREL CAD II LABORATORY	0	0	4	2	4	100	0	100	PC
18FT608	GARMENT CONSTRUCTION III LABORATORY	0	0	4	2	4	100	0	100	PC
18GE601	SOFT SKILLS - APTITUDE II	0	0	2	-	2	100	0	100	PC
Total		**15**	**0**	**16**	**22**	**30**	**600**	**300**	**900**	**-**

VII SEMESTER

Code No.	**Course**	**L**	**T**	**P**	**C**	**Hours/ Week**	**Maximum Marks**			**Category**
							CA	**ES**	**Total**	
18HS003	PRINCIPLES OF MANAGEMENT	2	0	0	2	2	50	50	100	HS
18FT702	APPAREL SOURCING AND COSTING	3	0	0	3	3	50	50	100	PC
18FT703	APPAREL PRODUCTION MANAGMENT	3	0	2	4	3	50	50	100	PC
18FT704	GARMENT TESTING – PERFORMANCE AND SUSTAINABILITY	3	0	0	3	4	50	50	100	PC
	PROFESSIONAL ELECTIVE V	3	0	0	3	3	50	50	100	PE
	PROFESSIONAL ELECTIVE VI	3	0	0	3	3	50	50	100	PE
18FT707	PRODUCT DEVELOPMENT LABORATORY	0	0	4	2	4	100	0	100	PC
18FT708	PROJECT WORK I	0	0	6	3	6	50	50	100	EEC
Total		**17**	**0**	**12**	**23**	**28**	**450**	**350**	**800**	**-**

VIII SEMESTER

Code No.	**Course**	**L**	**T**	**P**	**C**	**Hours/ Week**	**Maximum Marks**			**Category**
							CA	**ES**	**Total**	
	PROFESSIONAL ELECTIVE VII	3	0	0	3	3	50	50	100	PE
	PROFESSIONAL ELECTIVE VIII	3	0	0	3	3	50	50	100	PE
	PROFESSIONAL ELECTIVE IX	3	0	0	3	3	50	50	100	PE
18FT804	PROJECT WORK II	0	0	18	9	18	50	50	100	EEC
Total		**9**	**0**	**18**	**18**	**24**	**200**	**200**	**400**	**-**

ELECTIVES										
LANGUAGE ELECTIVES										
Code No.	**Course**	**L**	**T**	**P**	**C**	**Hours/ Week**	**Maximum Marks**			**Category**
							CA	**ES**	**Total**	
18HS201	COMMUNICATIVE ENGLISH II	1	0	2	2	3	100	0	100	HS
18HSH01	HINDI	1	0	2	2	3	100	0	100	HSS
18HSG01	GERMAN	1	0	2	2	3	100	0	100	HSS
18HSJ01	JAPANESE	1	0	2	2	3	100	0	100	HSS
18HSC01	CHINESE	1	0	2	2	3	100	0	100	HSS
18HSF01	FRENCH	1	0	2	2	3	100	0	100	HSS
PHYSICS ELECTIVES										
18GE0P1	NANOMATERIALS SCIENCE	3	0	0	3	3	50	50	100	BS
18GE0P2	SEMICONDUCTOR PHYSICS AND DEVICES	3	0	0	3	3	50	50	100	BS
18GE0P3	APPLIED LASER SCIENCE	3	0	0	3	3	50	50	100	BS
CHEMISTRY ELECTIVES										
18GE0C1	CORROSION SCIENCE AND ENGINEERING	3	0	0	3	3	50	50	100	BS
18GE0C2	ENERGY STORING DEVICES	3	0	0	3	3	50	50	100	BS
18GE0C3	POLYMER SCIENCE	3	0	0	3	3	50	50	100	BS
MATHEMATICS ELECTIVES										
18GE0M1	GRAPH THEORY AND COMBINATORICS	3	0	0	3	3	50	50	100	BS
18GE0M2	ALGEBRA AND NUMBER THEORY	3	0	0	3	3	50	50	100	BS
18GE0M3	MATHEMATICAL FINANCE AND QUEUEING THEORY	3	0	0	3	3	50	50	100	BS
ENTREPRENEURSHIP ELECTIVES										
18GE0E1	ENTREPRENEURSHIP DEVELOPMENT I	3	0	0	3	3	50	50	100	PE
18GE0E2	ENTREPRENEURSHIP DEVELOPMENT II	3	0	0	3	3	50	50	100	PE
DISCIPLINE ELECTIVES										
18FT001	HOME FURNISHINGS	3	0	0	3	3	50	50	100	PE
18FT002	CLOTHING COMFORT	3	0	0	3	3	50	50	100	PE
18FT003	FASHION COMMUNICATION	3	0	0	3	3	50	50	100	PE
18FT004	FASHION STYLING AND MODELING	3	0	0	3	3	50	50	100	PE
18FT005	INTIMATE FASHION	3	0	0	3	3	50	50	100	PE
18FT006	FASHION ACCESSORIES	3	0	0	3	3	50	50	100	PE

18FT007	TREND ANALYSIS AND FORECASTING	3	0	0	3	3	50	50	100	PE
18FT008	FASHION PHOTOGRAPHY	3	0	0	3	3	50	50	100	PE
18FT009	PSYCHOLOGY OF COLOR	3	0	0	3	3	50	50	100	PE
18FT010	INTERIOR DESIGN	3	0	0	3	3	50	50	100	PE
18FT011	FASHION CRAFTS	3	0	0	3	3	50	50	100	PE
18FT012	ADVANCED PATTERN ENGINEERING	3	0	0	3	3	50	50	100	PE
18FT013	PLANT LAYOUT AND FACILITIES DESIGN	3	0	0	3	3	50	50	100	PE
18FT014	QUALITY CONTROL OF GARMENTS AND ACCESSORIES	3	0	0	3	3	50	50	100	PE
18FT015	FASHION BRAND MANAGEMENT	3	0	0	3	3	50	50	100	PE
18FT016	INTERNATIONAL BUSINESS IN APPAREL INDUSTRY	3	0	0	3	3	50	50	100	PE
18FT017	SUPPLY CHAIN MANAGEMENT	3	0	0	3	3	50	50	100	PE
18FT018	HUMAN RESOURCE MANAGEMENT	3	0	0	3	3	50	50	100	PE
18FT019	PROJECT MANAGEMENT	3	0	0	3	3	50	50	100	PE
18FT020	FASHION ENTREPRENEURSHIP	3	0	0	3	3	50	50	100	PE
18FT021	INTERNATIONAL SOCIAL COMPLIANCE	3	0	0	3	3	50	50	100	PE
18FT022	ERP AND MIS IN APPAREL INDUSTRY	3	0	0	3	3	50	50	100	PE
18FT023	GRAPHIC DESIGNING FOR LAYOUTS	3	0	0	3	3	50	50	100	PE
18FT024	HISTORY OF FASHION	3	0	0	3	3	50	50	100	PE
18FT025	INDIAN TRADITIONAL TEXTILES	3	0	0	3	3	50	50	100	PE
18FT026	TECHNICAL DESIGN FOR FASHION	3	0	0	3	3	50	50	100	PE
18FT027	NEW GENERATION FIBER	3	0	0	3	3	50	50	100	PE
18FT028	SUSTAINABILITY IN PROCESSING	3	0	0	3	3	50	50	100	PE
18FT029	RISK ANALYSIS IN GARMENT INDUSTRY	3	0	0	3	3	50	50	100	PE
OPEN ELECTIVES										
18FT0YA	FASHION CRAFTS	3	0	0	3	3	50	50	100	OE
18FT0YB	FASHION ACCESSORIES	3	0	0	3	3	50	50	100	OE
18FT0YC	FASHION VISUAL MERCHANDISING	3	0	0	3	3	50	50	100	OE
18FT0YD	INTERIOR DESIGN	3	0	0	3	3	50	50	100	OE
18FT0YE	SURFACE EMBELLISHMENT	3	0	0	3	3	50	50	100	OE
ONE CREDIT COURSES										

18FT0XA	LEAN MANUFACTURING	1	0	0	1	16	100	0	100	EEC
18FT0XB	INTELLECTUAL PROPERTY RIGHTS	1	0	0	1	16	100	0	100	EEC
18FT0XC	BUYERS MANUAL	1	0	0	1	16	100	0	100	EEC
18FT0XD	BIO-MIMICRY IN FASHION	1	0	0	1	16	100	0	100	EEC
18FT0XE	DRAPING AND FITTING	1	0	0	1	16	100	0	100	EEC
18FT0XF	PRODUCT CERTIFICATION IN GARMENT INDUSTRY	1	0	0	1	16	100	0	100	EEC
18FT0XG	DENIM FABRICS AND GARMENTS	1	0	0	1	16	100	0	100	EEC
18FT0XH	FABRIC DEVELOPMENT AND SOURCING	1	0	0	1	16	100	0	100	EEC
18FT0XI	SKILL DEVELOPMENT ON APPAREL PRODUCTION PLANNING PACKAGE	1	0	0	1	16	100	0	100	EEC
18FT0XJ	VISUAL MERCHANDISING	1	0	0	1	16	100	0	100	EEC
18FT0XK	ESSENTIALS OF PHOTOGRAPHY	1	0	0	1	16	100	0	100	EEC
18FT0XL	FASHION PRODUCT TESTING FOR SUSTAINABILITY	1	0	0	1	16	100	0	100	EEC
18FT0XM	PHOTOSHOP FOR FASHION DESIGN	1	0	0	1	16	100	0	100	EEC
18FT0XN	ILLUSTRATOR FOR FASHION DESIGN	1	0	0	1	16	100	0	100	EEC
18FT0XO	MICROPROCESSORS APPLICATIONS	1	0	0	1	16	100	0	100	EEC
18FT0XP	ENERGY AUDITS IN GARMENT INDUSTRY	1	0	0	1	16	100	0	100	EEC
18FT0XQ	ESSENTIALS OF MICROSOFT EXCEL IN THE APPAREL INDUSTRY	1	0	0	1	16	100	0	100	EEC
18FT0XR	SIX SIGMA	1	0	0	1	16	100	0	100	EEC
18FT0XS	SOCIAL COMPLIANCE, STANDARDS AND SPECIFICATIONS	1	0	0	1	16	100	0	100	EEC
18FT0XT	FASHION DIGITAL ILLUSTRATION	1	0	0	1	16	100	0	100	EEC
18FT0XU	QUALITY ASSURANCE AND TESTING PROCEDURE	1	0	0	1	16	100	0	100	EEC
18FT0XV	CHARACTERISTICS AND APPLICATION OF MEDICAL GARMENTS	1	0	0	1	16	100	0	100	EEC
18FT0XW	DIGITAL FASHION	1	0	0	1	16	100	0	100	EEC
18FT0XX	BUSINESS MODELS FOR SUSTAINABILITY	1	0	0	1	16	100	0	100	EEC
18FT0XY	GARMENT DRAPING AND FIT ANALYSIS	1	0	0	1	16	100	0	100	EEC
ADDITIONAL ONE CREDIT COURSE										
18GE0XA	ETYMOLOGY	1	0	0	1	-	100	0	100	EEC

18GE0XB	GENERAL PSYCHOLOGY	1	0	0	1	-	100	0	100	EEC
18GE0XC	NEURO BEHAVIORAL SCIENCE	1	0	0	1	-	100	0	100	EEC
18GE0XD	VISUAL MEDIA AND FILM MAKING	1	0	0	1	-	100	0	100	EEC
18GE0XE	YOGA FOR HUMAN EXCELLENCE	1	0	0	1	-	100	0	100	EEC
18GE0XF	VEDIC MATHEMATICS	1	0	0	1	-	100	0	100	EEC
18GE0XG	HEALTH AND FITNESS	1	0	0	1	-	100	0	100	EEC
18GE0XH	CONCEPT, METHODOLOGY AND APPLICATIONS OF VERMICOMPOSTING	1	0	0	1	-	100	0	100	EEC
18GE0XI	BLOG WRITING	1	0	0	1	-	100	0	100	EEC
18GE0XJ	INTERPERSONAL SKILLS	1	0	0	1	-	100	0	100	EEC
18GE0XK	COMMUNITY SERVICE AND LEADERSHIP DEVELOPMENT	1	0	0	1	-	100	0	100	EEC
18GE0XL	NATIONAL CADET CORPS	1	0	0	1	-	100	0	100	EEC
18GE0XM	NEW AGE INNOVATION AND ENTREPRENEURSHIP	1	0	0	1	-	100	0	100	EEC
18GE0XN	DISRUPTIVE INNOVATION BASED STARTUP ACTIVITIES	1	0	0	1	-	100	0	100	EEC
18GE0XO	SOCIAL PSYCHOLOGY	1	0	0	1	-	100	0	100	EEC

18FT101 ENGINEERINGMATHEMATICS I 3 1 0 4

Course Objectives

- Understand the concepts of vectors and Eigenvectors for different matrices to describe thestability of the linear systems in engineering fields.
- Exemplify the concepts of differentiation and integration to identify the area of 2D and 3Dsurfaces in engineering problems.
- Explain the concepts of analytic functions in complex domain to predict the nature of different engineering systems.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Carry out the different forms of coordinate system in complex plane and characteristics of linear systems by Eigen values and Eigen vectors.
2. Breakdown various types of functions and their differentiation techniques involved in engineering fields.
3. Evaluate different methods of integration used in engineering problems.
4. Apply the suitable integration technique to calculate the area and volume of different surfaces.
5. Apply the concept of analytic function to estimate the integral in complex plane.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1		3												
2		2												
3		3												
4	1	2												
5	2	2												

UNIT I **12 Hours**

COMPLEX NUMBERS, VECTORS AND MATRICES

Complex plane, polar coordinates and polar form of complex numbers, powers and roots, fundamental theorem of algebra. Vector algebra in 2-D and 3-D space, dot product and cross product. Matrices: Eigen values and Eigen vectors, Properties of Eigen values and Eigen vectors.

UNIT II **12 Hours**

CALCULUS

Limits and Continuity of Functions: Limits of functions, types of limits, evaluation of limits, continuity of functions, properties of continuous functions. Derivatives: Derivatives, differentiability, rules and properties, differentiation of transcendental functions, higher order derivatives, implicit differentiation, differentiation of hyperbolic functions. Integration: Anti-derivatives, Riemann Sum, indefinite and definite integration, Mean Value Theorem for definite integral, Fundamental Theorem of Calculus.

UNIT IV **12 Hours**

APPLICATIONS OF DERIVATIVES AND INTEGRATIONS

Extreme values, points of inflection and curve sketching, Rolle's Theorem, Mean Value Theorem, optimization, indeterminate forms, L'Hopital's Rule. Area between curves, volume of a general solid by slicing and cylindrical shell methods, volume of a solid of revolution, length of plane curves, area of a surface of revolution.

UNIT V **12 Hours**

COMPLEX ANALYSIS

Analytic Functions- Properties of Analytic function - Determination of Analytic Function using Milne Thompson method. Cauchy's Integral Formula - Classification of Singularities - Cauchy's Residue Theorem.

Total: 60 Hours

References

1. Finney RL, Weir MD and Giordano FR, Thomas' Calculus, 10th edition, Addison-Wesley, 2001
2. Smith RT and Minton RB, Calculus, 2nd Edition, McGraw Hill, 2002.
3. Kreysgiz E, Advanced Engineering Mathematics, 8th edition, John Wiley & Sons, 1999.
4. Anton H, Calculus with Analytic Geometry, 5th edition, John Wiley & Sons, 1995.
5. Ayres F Jr and Mendelson E, Schaum's Outline of Theory and Problems of Calculus, 4th edition, McGraw Hill, 1999.
6. S.C. Gupta, Fundamentals of Statistics, 7th Edition, Himalaya Publishing House Pvt. Ltd. 2018.

18FT102 ENGINEERING PHYSICS I 2 0 2 3

Course objectives

- Illustrate the Newton's laws of motion and wave motion with applications
- Understand the basic properties of electricity, magnetism and optics
- Differentiate the special theory of relativity and quantum physics from classical physics

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Course Outcomes (COs)

At the end of the course, students will be able to

1. Assess the Newton's three laws of motion and apply the same to solve the real world problems involving elevator, atwood machine and acceleration of objects.
2. Select the physical characteristics of simple harmonic motion, wave motion and find the solutions for wave equations.
3. Analyse the fundamental laws, properties of electricity and magnetism and apply the same toelectric and magnetic elements.

4. Apply the principles of physical and geometrical optics in the mirrors, lenses, microscopes and diffraction gratings
5. Outline the importance of special theory of relativity, quantum physics and analyse the wave and particle nature of matter

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	1							2					
2	2								2					
3	2	2												
4	2	2							2					
5	2	1							2					

UNIT I **6 Hours**

MECHANICS

Newton's laws of motion: Concept of force and its nature – Newton's first law and inertial frames definition of mass – Newton's second law-gravitational force and weight – Newton's third law. Applications of Newton's laws: particle in equilibrium, particle under net force – weighing a mass in an elevator, the atwood machine and acceleration of two objects connected by a cord.

UNIT II **6 Hours**

OSCILLATIONS AND WAVES

Fundamentals of simple harmonic motion – energy of simple harmonic oscillator – spring mass system – time period of simple pendulum, compound pendulum and torsional pendulum – Damped oscillations. Travelling wave motion – sinusoidal waves on strings – speed of a wave – reflection and transmission– rate of energy transfer in wave motion.

UNIT III **6 Hours**

ELECTRICITY AND MAGNETISM

Point charges – electric fields – Gauss's law and its applications – electric potential capacitance – energy stored in a capacitor. Concept and source of magnetic fields – Ampere's theorem – determination of magnetic field due to different current distributions – Faraday's law – self-induction and mutual induction – energy stored in an inductor.

UNITIV **6 hours**

LIGHT AND OPTICS

Nature of light – laws of reflection and refraction – refractive index and Snell's law – dispersion of light – total internal reflection – image formation: concave mirrors – convex mirrors – thin lenses – compound microscope – human eye. Conditions of interference – Young's double slit experiment – intensity distribution of interference – phase change due to reflection – diffraction-narrow slit diffraction – single slit and two slit – intensity distribution – diffraction grating – applications.

UNIT V **6Hours**

MODERN PHYSICS

Special theory of relativity – simultaneity and time dilation – twin paradox – length contraction – relativistic mass variation – space time graph. Black body radiation and Planck hypothesis – allowed energy levels – thermal radiation from different objects – photoelectric and Compton effect. Matter waves – de-Broglie hypothesis – wave nature of particles – Davission- Germer experiment.

1 **5 Hours**

EXPERIMENT 1

Determination of resultant of system of concurrent coplanar forces-Parallelogram law of forces.

2 **5 Hours**

EXPERIMENT 2

Determination of moment of inertia-Torsional pendulum.

3 **5 Hours**

EXPERIMENT 3

Determination of wavelength of mercury spectral lines-spectrometer

4 **4 Hours**

EXPERIMENT 4

Determination of refractive index of solid and liquid-travelling microscope

5 **3 Hours**

EXPERIMENT 5

Determination of wavelength of laser-diffraction grating

6 **4 Hours**

EXPERIMENT 6

Determination of frequency of a tuning fork-Melde's apparatus

7 **4 Hours**

EXPERIMENT 7

Thickness of a thin wire using interference of light-Air wedge method

Total: 60 Hours

References

1. R A Serway and J W Jewitt, Physics for Scientists and Engineers, Thomson Brooks/Cole, 2011
2. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc, 2011
3. H C Verma, Concepts of Physics (Vol I & II), Bharathi Bhawan Publishers & Distributors, New Delhi, 2017
4. H D Young and R A Freedman, Sears and Zemansky's University Physics with Modern Physics, Pearson education, 2016
5. R K Gaur and S L Gupta, Engineering Physics, Dhanpat Rai Publications, 2012.

18FT103 ENGINEERING CHEMISTRY I 2 0 2 3

Course Objectives

- Explain the composition and properties of clothing care items
- Differentiate between ionic, covalent, coordinate bonding and classify the bonding between dyeand fabric as ionic or covalent
- Review types, sources, chemical composition/properties and applications of different fibresused in fashion industry
- Select suitable accessories to create new designs by analyzing its properties

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Analyse the influence of hard water, chemical action of soap and role of stiffening agents on fabrics
2. Analyse the influence of different chemical bonds on the dye fiber interaction
3. Analyse fibres based on source/applications and Find the type of fibre through chemicaltest
4. Differentiate natural, synthetic and semi synthetic fibres based on its chemical composition, properties and applications
5. Outline the chemical properties and uses of metals and gems as fashion accessories

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2													2
2	2	1											3	
3	1	2			1								2	
4	1	1			2								1	
5	2	2			1								2	

UNIT I **7 Hours**

CLOTHING CARE

Water- hard and soft water - Determination of water hardness (EDTA method) - methods of softening water: Ion exchange process. Stain Removal: Laundry soaps - Composition of soap - chemical action. Difference between soap and detergents. Various solvents for stain removing blood, tea, rust; oil/grease. Stiffening Agents: Purpose of stiffening - classification - uses of stiffeners- natural and commercial starches.

UNIT II **5 Hours**

CHEMICAL BONDING

Ionic, covalent and co-ordinate bonds (overview only) -hydrogen bonding and its consequences- Vander Waals forces (dipole-dipole, dipole-induced dipole) -. Interaction between fibres/polymers and dyes (basic concept only) - dye substrate affinity (dyes for cellulose fibres and silk).

UNIT III **5 Hours**

INTRODUCTION TO FIBRES

Types of fibres (staple and filament fibres) - classification of fibres - based on source, and application-polymeric nature of fibres- differences between natural and synthetic fiber - fiber identification- burn test. Difference between fiber and fabrics

UNIT IV **5 Hours**

FIBERS IN FASHION INDUSTRY

Natural fibres: Classification - Identification - Chemical composition/properties and applications: Cellulosic fibres (cotton and hemp) - protein fibres (wool and silk) - semisynthetic fibers (rayon). Synthetic fibers (polyester and nylon).

UNIT V **7 Hours**

FASHION ACCESSORIES

Definition/ chemical properties and uses- Terracotta and quilling. Metals in fashion accessories: Atomic structure, properties and applications of base/coat metals-Iron, Nickel, Copper, Gold and Silver. Electroplating of Copper. Gemstones - classification - Inorganic and organic gemstones: composition and properties of Ruby, emerald, Topaz, Pearl, amber and coral

FURTHER READING

Applications of fibres in day to day life Fibre composites - Smart clothes using composite fibres
Impact of corrosion in textile and fashion industry

1 **2 Hours**

EXPERIMENT 1

Lab safety rules and guidelines for students

2 **2 Hours**

EXPERIMENT 2

Preparation of N/10 and M/10 oxalic acid and sodium carbonate solutions

3 **4 Hours**

EXPERIMENT 3

Determination of hardness in the water sample by EDTA method

4 **2 Hours**

EXPERIMENT 4

Identify suitable solvent to remove the stain due to organic or inorganic compounds

5 **4 Hours**

EXPERIMENT 5

Preparation of starch indicator and application in iodometric titration for determination of Hypochlorite in a Commercial Bleach Product

6 **4 Hours**

EXPERIMENT 6

Collect and document three natural as well as synthetic fibers and list its properties and uses

7 **4 Hours**

EXPERIMENT 7

Design suitable fashion accessories using economically viable recyclable materials (Paper/clay)

8 **4 Hours**

EXPERIMENT 8

Demonstration of electroplating of copper on stainless steel object

9 **4 Hours**

EXPERIMENT 9

Estimation of amount of copper in brass by EDTA method

Total: 60 Hours

Reference(s)

1. J.D. Lee, Concise inorganic chemistry, Blackman Science Ltd, France, Wiley-India, 5th edition(Reprint), 2016
2. V.R. Gowariker, N.V. Viswanathan and Jayader Sreedhar, Polymer Science, New Age International (P) Limited, 2nd edition, 2015
3. P. C. Jain and M. Jain, Engineering Chemistry, Dhanpat Rai Publications., New Delhi, 2016
4. B. R. Puri, L. R. Sharma and Madan S. Pathania, Principles of Physical Chemistry, Shoban Lal Nagin Chand & Co., 2010
5. Mihir Deb, Sanjib Chandra Sarkar, Minerals and Allied Natural Resources and their Sustainable Development, Springer, 2017
6. P. C. Jain and M. Jain, Engineering Chemistry, Dhanpat Rai Publications., New Delhi, 2016

18FT104 BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

2 0 2 3

Course Objectives

- To understand the basic concepts of electrical circuits and machines.
- To examine the speed control methods of DC motor and electrical safety devices.
- To illustrate the measurement techniques of illumination and noise levels.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Determine the electrical properties and means of measuring them.
2. Evaluate the construction and operation principles of electrical machines.
3. Apply the fundamental concepts of electronics.
4. Demonstrate knowledge of the measurement techniques applied for measuring Illumination levels and noise levels.
5. Analyze the safety measures incorporated in electrical machines and devices.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												
2	3	2												

3	3	2												
4	3	2												
5	3	2												

UNIT I **5 Hours**

ROPERTIES OF MATERIALS AND MEASUREMENT

Electrical properties such as Conductivity, Resistivity, Capacitance of Nano Materials and Fibres Measurement of Voltage, Current, Power and Power factor using Digital meter - LCRQ meter.

UNIT II **8 Hours**

ELECTRICAL MACHINES AND DRIVES

Construction and Operation of Permanent magnet DC motors, Single phase Induction Motor, Servo Motor - Drive system for Sewing Machines.

UNIT III **5 Hours**

FUNDAMENTALS OF ELECTRONICS

Characteristics of PN Junction diode, Timers - Display system, Interfacing DC motor with electronic control system.

UNIT IV **6 Hours**

LIGHTS AND SOUNDS

Lux, Luminance, Luminance Intensity, measurement using Lux meter - Types of Lamps: Mercury Vapour Lamp, LED, CFL - Fundamentals of Sound: Noise level, Decibels, Noise meter.

UNIT V **6 Hours**

EARTHING SAFETY AND ACCESSORIES

Earthing: Necessity- Types of Earthing, Measurement of Earth Resistance - Types of fuses, MCB, ELCB Necessity of Insulation - Types of Switches, Sockets and Plugs for sewing and automated cutting machines.

1 **6 Hours**

EXPERIMENT 1

Measurement of conductivity, resistivity of fibres and conducting polymers

2 **6 Hours**

EXPERIMENT 2

Develop a prototype driving mechanism for sewing mechines.

3 **6 Hours**

EXPERIMENT 3

Develop a electronic speed control system for DC motor.

4 **6 Hours**

EXPERIMENT 4

Develop a Lighting system with uniform lluminious intensity for a given location.

5 **6 Hours**

EXPERIMENT 5

Fuse replacement and earthing of equipment.

Total: 60 Hours

Reference(s)

1. A.L.Anwari, Basic of Electrical Engineering, Dhanpat Rai,2016.
2. Open Shaw Taylor, Utilization of Electrical Energy, University Press,2017.
3. Alan.S.Moris, Reza Langari, Measurement and Instrumentation, Elsevier.
4. R. S. Sedha, A Textbook of Applied Electronics, S.Chand & Company Ltd, 2013
5. D.S.Mathur, Elements of properties of materials, S.Chand Company, 2010.

18HS101 COMMUNICATIVE ENGLISH I **1 0 2 2**

Course Objectives

- Read and understand the main points on familiar matters regularly encountered in work,school, or leisure
- Listen and respond in most common situations where English is spoken
- Write simple connected texts on topics which are familiar or of personal interest
- Describe experiences and events, hopes and ambitions and briefly give reasons and explanations for opinions and plans

Programme Outcomes (POs)

i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Use appropriate grammar & vocabulary that is expected at the BEC Preliminary exam level
2. Outline the general meaning of non-routine letters within own work area, and short reports of a predictable nature
3. Show how straightforward, routine letters of a factual nature, and make notes on routine matters, such as taking/placing orders
4. Apply simple presentations/demonstrations
5. Support with predictable requests from a visitor, state routine requirements, and offer advice within own job area on simple matters.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1									1					
2									2					
3									3					
4										1				
5										2				

UNIT I **9 Hours**

GRAMMAR

Tenses Future continuous, Past continuous, Past perfect, Past simple, Past tense responses, Present perfect continuous, Present perfect/past simple Reported speech Adverbs intensifiers Comparatives and superlatives Conditionals 2nd and 3rd Connecting words expressing cause and effect, contrast Phrasal verbs Prepositions of place Simple passive - Wh-questions in the past Question tags Will and going to, for prediction.

UNIT II **9 Hours**

READING

Understanding short real-world notices, messages Detailed comprehension of factual material; skimming and scanning skills - Interpreting visual information Reading for detailed factual information Reading for gist and specific information - Grammatical accuracy and understanding of text structure - Reading and information transfer.

UNIT III **9 Hours**

WRITING

Internal communication including note, message, memo or email - arranging / rearranging appointments, asking for permission, giving instructions - Business correspondence including letter, fax, email apologising and offering compensation, making or altering reservations, dealing with requests, giving information about a product.

UNIT IV **9 Hours**

LISTENING

Listening for specific information Listening for numbers and letters Note completion Listening for gist listening to monologues (presentations, lectures, announcements and briefings) listening to interacting speakers (telephone conversations, face-to-face conversations, interviews and discussions).

UNIT V **9 Hours**

SPEAKING

Exchanging personal and factual information expressing and finding out about attitudes and opinions organise a larger unit of discourse Turn-taking, negotiating, collaborating, exchanging information, expressing and justifying opinions, agreeing and/or disagreeing, suggesting, speculating, comparing and contrasting, and decision-making.

Total: 45 Hours

Reference(s)

1. Alexander Garrett, Cambridge BEC Preliminary Students Book with Answers, Cambridge University Press, 2016.
2. Lan Wood, Anne Williams and Anna Cowper. Pass Cambridge BEC Preliminary, Second Edition, New Delhi, 2014.
3. Norman Whitby. Cambridge Business Benchmark. Pre-Intermediate to Intermediate, Students Book. South Asian Edition, 2018.

18FT106 ENGINEERING DRAWING 1 0 4 3

Course Objectives

- To learn conventions and use of geometry in producing Engineering curves.
- To draw 3D objects and structures using projection concepts.
- To produce multiple views of the given objects and structures.
- To represent 3D objects using analytical drawing techniques.
- To depict humans in their environment by adopting appropriate scales.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Show different types of curves applying geometrical concepts.
2. Execute in representative style, basic 3D forms and visual patterns.
3. Construct 3D objects and structures applying projection concepts.
4. Show geometrical objects and complex forms using analytical drawing techniques.
5. Design humans and their environment applying appropriate scales.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												
2	2	2												
3	2	2												
4	3	2												
5	3	2												

UNIT I **3 Hours**

ENGINEERING CURVES

Construction of hyperbola - eccentricity method. Construction of ellipse by concentric circle method, Construction of parabola by parallelogram method. Construction of Roulettes - Cycloids, Involutes.

UNIT II **3 Hours**

REPRESENTATION OF BASIC 3D FORMS AND VISUAL PATTERNS

Foreshortening, Overlapping, Shades and Shadows. Visual pattern and texture - Dialation and rotation, rotation and radiation, reflection, patterns as repetition. Basic design explorations - Exploration of design elements.

UNIT III **3 Hours**

PCITORIAL SYSTEMS

Orthographic projections. Axonometric projections - isometric and diametric. Perspective projections - 1 point perspective, 2 point perspective.

UNIT **3 Hours**

ANALYTICAL DRAWING

Analytical drawing - Geometrical objects, Additive forms, Subtractive forms, Complex forms.

UNIT V **3 Hours**

SCALES IN REPRESENTING ART

Bird's Eye view, Ant's Eye view, Human scales in situation sketching. Architecture and human scale, Human figure and Anatomy.

1 **6 Hours**

EXPERIMENT 1

Construction of hyperbola by eccentricity method and ellipse by concentric circle method.

2 **6 Hours**

EXPERIMENT 2

Construction of roulettes: cycloid and involutes

3 **6 Hours**

EXPERIMENT 3

Render a 3D object by foreshortening technique. highlight the shadows.

4 **6 Hours**

EXPERIMENT 4

Develop a visual pattern by dialation and rotation, radiation and rotation with reference to given inspiration

5 **6 Hours**

EXPERIMENT 5

Develop an orthographic projection of the given object

6 **6 Hours**

EXPERIMENT 6

Develop an isometric drawing and diametric drawing of the given reference object

7 **6 Hours**

EXPERIMENT 7

Develop a single point perspective drawing and two point perspective of the given scenario

8 **6 Hours**

EXPERIMENT 8

Develop an analytical drawing of the given geometric object. Show additive forms, subtractive forms and complex forms

9 **6 Hours**

EXPERIMENT 9

Depict the given picture in birds eye view and ants eye view.

10 **6 Hours**

EXPERIMENT 10

Depict the given scenario in situation sketching style.

Total : 75 Hours

Reference(s)

1. Allan Mcrobie, The seduction of curves: The lines of beauty that connects Mathematics, Art and the nude, Princeton University press, 2017.
2. Matt Rota, Pencil Art workshop: Techniques, ideas and inspirations for drawing and designing with pencil, Rockport publishers, 2017.
3. Deborah Velesquez, Drawing in Black and White: Creative exercises, Art techniques and Explorations in positive and negative design, Quarry books, 2016.
4. Francis D.K. Ching with Steven P Juroszek, Design drawing, John Wiley and sons, 2nd edition 2013.
5. K.V.Natarajan, A Text Book of Engineering Graphics, Dhanalakshmi Publishers, 2013.

18FT201 ENGINEERING MATHEMATICS II **3 1 0 4**

Course Objectives

- Understand the concepts of partial derivatives and multiple integrals to define the area,volume and extreme values of various surfaces in engineering fields.

- Classify the sequences and series in linear systems is convergent or divergent.
- Formulate the real time engineering problem into mathematical model using ordinarydifferential equation and solve it by appropriate method.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Analyse the various parameters in partial differentiation and characterize the maxima and minima functions for signals and systems.
2. Apply multiple integral concepts to calculate the area and volume by appropriate vector integral theorems.
3. Analyze the convergence and divergence of sequences and series by various tests.
4. Construct first order differential equations from real time phenomena and solve it by suitable method.
5. Execute the appropriate method to solve the second order differential equations.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	2												
2	2	2												
3	1	3												
4	1	3												
5	2	3												

UNITI **12 Hours**

PARTIAL DIFFERENTIATION

Functions of several variables, plotting of 2-variable functions, introduction to cylindrical and spherical coordinates, chain rule, total differential, gradient, directional derivatives, normal lines and tangent planes, extreme of functions of two variables, applications.

UNIT II **12 Hours**

MULTIPLE INTEGRALS

Double integrals, regions of integrations, triple integrals, applications (Cartesian coordinates only- Green's theorem and Gauss Divergence theorem.

UNIT III **12 Hours**

HOURS SEQUENCES AND SERIES

Sequences and series, convergence and divergence of series, absolute convergence, conditional convergence, test for convergence and divergence. Power series for functions, interval of convergence, Taylor and Maclaurin series, Taylor's Theorem with remainder.

UNIT IV **12 Hours**

FIRST ORDER DIFFERENTIAL EQUATIONS

Separable differential equations, homogeneous differential equations, exact differential equations, integrating factor, Bernoulli's equation, applications.

UNIT V **12 Hours**

SECOND ORDER DIFFERENTIAL EQUATIONS

Second order homogeneous and non-homogeneous equations with constant coefficients, variation of parameters, method of undetermined coefficients, series solutions of differential equations, applications.

Total: 60 Hours

References

1. Finney RL, Weir MD and Giordano FR, Thomas' Calculus, 10th edition, Addison-Wesley, 2001

2. Smith RT and Minton RB, Calculus, 2nd Edition, McGraw Hill, 2002.Kreysgiz E, Advanced Engineering Mathematics, 8th edition, John Wiley & Sons, 1999.

3. Ray Wylie and C Louis Barrett, Advanced Engineering Mathematics, Sixt Edition, Tata McGraw- Hill Publishing Company Ltd, 2003.

4. Peter V. O Neil , Advanced Engineering Mathematics, Seventh Edition Cengage Learning India Private Limited, 2012.

5. Glyn James, Advanced Engineering Mathematics, Third Edition, Wiley India, 2014.

18FT202 ENGINEERING PHYSICS II 2 0 2 3

Course Objectives

- The students will be able to
- understand the elastic and surface properties of materials for their relevant applications to variousstreams of engineering and technology
- realize the importance of static and dynamic friction in textile materials
- apply the concepts involved in thermodynamics for solving the real world problems

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

b. Problem Analysis: Identify, formulate, review research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

Course Outcomes (COs)

At end of the course the students will be able to

1. Analyse the elastic properties of materials in terms of the three modulii of elasticity and surface properties of liquids
2. Evaluate the wave properties, generation of ultrasonics and their applications in the field of nondestructive testing methods
3. Show the crystal structure, crystal planes and unit cell characteristics of cubic crystal systems

4. Assess the differences between static and dynamic friction and effect of wear and abrasions in textile machinery parts
5. Apply the knowledge of thermodynamics in calculating the heat requirement for fabric process and analyze kinetics of dyeing.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	3						3	1			3	
2	1	2	3						3	1			3	2
3	3	2	3						3	1			3	2
4	3	2	3						3	1			3	2
5	1	2	3						3	1			3	3

UNIT I **6 Hours**

ELASTICITY ANDSURFACE PROPERTIES

Elasticity: elastic and plastic behavior of materials - stress - strain diagram - Hooke's law – types of elastic modulii: Young's modulus - bulk modulus - rigidity modulus - Poisson's ratio - factors affecting elasticity. Surface properties: cohesive force - adhesive force - factors affecting surface tension - interfacial tension - emulsions - detergency - foaming - wettability - coefficient of viscosity- Stoke's law - Poiseuille's law - coefficient of viscosity of various liquids.

UNIT II **6 Hours**

ULTRASONICS

Properties of ultrasonic waves - generation: magnetostriction and piezoelectric methods - detection of ultrasonic waves - velocity of ultrasonic waves using acoustic grating. Nondestructive testing: pulse echo method - merits and demerits - applications: drilling - cutting – SONAR.

UNIT III **6 Hours**

SOLIDSTATE PHYSICS

Crystalline and noncrystalline materials - lattice points - space lattice - crystal structure -unit cells - Bravais lattice and crystal systems - Miller indices - procedure for finding Miller indices-relation between interplanar distance and interatomic distance - unit cell characteristics of SC, BCC, FCC and HCP structures

UNIT IV **6 Hours**

FRICTION

Friction: basic laws - static and dynamic friction - adhesion - sheering theory - surface roughness - deformation - ploughing - normal adhesion - effects of speed on friction - wear and abrasion – frictional behavior of elastomers - rolling friction.

UNIT V **6 Hours**

THERMODYNAMICS

Heat - equilibrium and quasistatic process - path functions - comparison between heat and work - internal energy - laws of thermodynamics - isothermal and adiabatic process - work done - reversible and irreversible process - entropy diffusion- model for diffusion - diffusion coefficient - rate of dyeing, equilibrium, exhaustion, migration, adsorption and absorption of dyes - kinetics of dyeing with disperse dyes.

1 **4 Hours**

EXPERIMENT 1

Find the elevation of the given wooden beam at the midpoint by loading at the end and hence calculate the Young's modulus of the material.

2 **4 Hours**

EXPERIMENT 2

Find the depression at the midpoint of the given wooden beam for 50g, 100 g, 150 g, 200 g and 250 g subjected to non-uniform bending and determine the Young's modulus of the material of the beam.

3 **4 Hours**

EXPERIMENT 3

Determine the moment of inertia of the disc and calculate the rigidity modulus of a given wire using torsion pendulum (symmetrical masses method).

4 **4 Hours**

EXPERIMENT 4

Determine the coefficient of viscosity of a given liquid by Poiseuille's method.

5 **4 Hours**

EXPERIMENT 5

Determine the

(i) wavelength of ultrasonics in a liquid medium,
(ii) velocity of ultrasonic waves in the given liquid
(iii) Compressibility of the given liquid using ultrasonic interferometer.

6 **5 Hours**

EXPERIMENT 6

Determine the coefficient of thermal conductivity of a bad conductor by Lee's disc method.

7 **5 Hours**

EXPERIMENT 7

Form the interference fringes from the air wedge setup and calculate the thickness of the given material (yarn).

Total: 60 Hours

References

1. A. Serway and John W. Jewett, JR. Physics for Scientists and Engineers with Modern Physics, Ninth Edition Raymond, 2016.
2. Bhattacharya, D.K. & Poonam, T. Engineering Physics. Oxford University Press, 2015.
3. Gaur, R.K. & Gupta, S.L. Engineering Physics. Dhanpat Rai Publishers, 2012.
4. Pandey, B.K. & Chaturvedi, S. Engineering Physics‖. Cengage Learning India, 2012.
5. B.S. Gupta, Friction in textile materials, Wood Cut Publishing Pvt Ltd. 2008.

18FT203 ENGINEERING CHEMISTRY II 2 0 2 3

Course Objectives

- Explain the significance of electromagnetic spectrum on color theory based on complementary colors of light, chromophore, auxochrome, intensity shifts and illustrate photo processes based on Jablonski diagram
- Classify dyes based on source, its extraction methods and measures towards sustainable development.
- Summarize the ingredients in paint for different applications in fashion industry

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Course Outcomes (COs)

1. Analyse different regions in an electromagnetic spectrum and find chromophores based on intensity shifts.
2. Analyse the influence of electromagnetic radiation in photochemical process of dyes.
3. Differentiate natural and synthetic dyes based on its source, three extraction methods of natural dyes and research outcomes for sustainable dyeing process
4. Find the constituents and functions in paint, varnish and lacquers.
5. Select suitable colouring chemicals based on the composition and properties for different applications in fashion industry

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2												
2	2	1												
3	2	2					1							
4	3	2												
5	3	2					1							

UNIT **6 Hours**

COLOUR THEORY FOR DESIGNERS

Colour terminology: Electromagnetic spectrum - absorption of radiation - electronic, vibrational and rotational transitions. Regions of electromagnetic spectrum - complementary colours. Chromophores, auxochrome, hyper chromic shift, hypochromic shift, hypochromic shift and bathochromic shift - conjugated chromophores

UNIT II **7 Hours**

PHOTOCHEMISTRY OF DYES

Photochromic dyes. Thermochromic dyes (Leuco dyes). Laws of photochemistry- Lambert-Beer Law and its limitations. Photo processes - Jablonski diagram (Internal Conversion, Inter-system crossing, Fluorescence, Phosphorescence) Chemiluminesence and Photo-sensitization- principle, instrumentation (Block diagram), Applications- Colorimetric analysis (estimation of Prussian blue dye). Application

UNIT III **6 Hours**

CLASSIFICATION OF DYES

Natural and synthetic dyes-examples. Evolution of natural dyes sources - extraction methods applications- sustainability- from unsustainable to sustainable development.

UNIT IV **5 Hours**

PAINTS

Characteristics of a good paint constituents and functions: Pigment drying oil thinners driers fillers - plasticizers ant skinning agents. Varnish: Types constituents and functions. Lacquers: Constituents, examples and functions.

UNIT V **6 Hours**

COLORS OF FASHION

Historical painting materials. Paints for fabrics: Acrylic composition-mechanism of drying. Fire retardant paint- composition and properties. Face and body paint: types-(natural and synthetic) - composition. Hair colour: Types- composition-effect of pH.

SELF STUDY

Finger print region (IR) Fire proof paint

1 **4 Hours**

EXPERIMENT 1

Interpretation of extended chromophore present in organic compound by UV-Visible spectrum

2 **4 Hours**

EXPERIMENT 2

Estimation of the concentration of Prussian blue dye by Colorimetric analysis

3 **4 Hours**

EXPERIMENT 3

Extraction of natural dye from plants using different methods soxhlet extraction/IR extraction/microwave extraction/Ultrasonic extraction

4 **4 Hours**

EXPERIMENT 4

Application of extracted natural dye on different fabrics of cotton and silk.

5 **4 Hours**

EXPERIMENT 5

Removal of dye effluents in water by activated charcoal

6 **4 Hours**

EXPERIMENT 6

Application of varnish on naturally derived product

7 **2 Hours**

EXPERIMENT 7

Estimation of strength of HCl by pH metric titration method

8 **2 Hours**

EXPERIMENT 8

Preparation of face and body paint for fashion applications

Total: 60 Hours

Reference(s)

1. 1. J.D. Lee, Concise inorganic chemistry, Blackman Science Ltd, France, Wiley-India, 5th edition(Reprint), 2016
2. 2. V.R. Gowariker, N.V. Viswanathan and Jayader Sreedhar, Polymer Science, New Age International (P) Limited, 2nd edition, 2015
3. 3. P. C. Jain and M. Jain, Engineering Chemistry, Dhanpat Rai Publications., New Delhi, 2016
4. 4. P. Gregory, Classification of Dyes by Chemical Structure, Springer, Boston, MA, 1990.
5. 5. D. R. Waring et al. (eds.), The Chemistry and Application of Dyes Ã‚Â© Plenum Press, New York 1990

18FT204 COMPUTER PROGRAMMING **2 0 2 3**

Course Objectives

- To learn the basics of Excel.
- To study the basics of C primitives, operators and expressions.
- To understand the different primitive and user defined data types.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

Course Outcomes (COs)

1. Design applications using Excel and work with formulas and functions in Excel
2. Compute programs using operators and input-output functions
3. Apply decision making and looping statements in writing C programs
4. Apply the concepts of arrays and strings in developing C programs
5. Design applications using structures and functions in C

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3	3		3									
2	2	2	1		3									
3	2	3	2		3									
4	2	2	2		3									
5	2	2	2		3									

UNIT I **3 Hours**

WORKING WITH EXCEL

Introduction-Working with Excel workbook-Working with Worksheet-Formulas and functions-Inserting charts- Sorting.

UNIT II **3 Hours**

INTRODUCTION TO C PROGRAMMING

Overview of C-Structure of C program-Keywords-Constants- Variables-Data types-Type conversion Operators and Expressions: Arithmetic-Relational-Logical-Assignment- Increment and Decrement-Conditional-Bitwise operators.

UNIT III **3 Hours**

CONTROL STATEMENTS

Decision Making and Branching: simple if statement-if else statement-nesting of if else Statement-Switch Statement. Decision Making and Looping: while statement-do while statement-for statement - Jump Statements: goto-break-continue-return statement

UNIT IV **3 Hours**

ARRAYS AND STRINGS

Arrays: Introduction, one dimensional array, declaration - Initialization of one dimensional array, two-dimensional arrays, multi-dimensional arrays. Strings: String handling functions.

UNIT V **3 Hours**

STRUCTURES AND FUNCTIONS

Structures: Introduction-defining a structure- declaring structure variables-accessing structure members- structure initialization-Enumerated data type User Defined Functions: Elements of user defined functions -Definition of functions-return values and their types- function calls-function declaration-categories of function -call by value and call by reference-recursion.

SELF STUDY

Creating and manipulating document using word - Mail merge - Creating spread sheet with charts and formula using excel - developing power point presentation with Animations - C graphics using built in functions.

1 **4 Hours**

EXPERIMENT 1

Working with Excel sheet

2 **4 Hours**

EXPERIMENT 2

Implement a C program using data types and operators.

3 **4 Hours**

EXPERIMENT 3

Implement C program using if else and switch statements.

4 **6 Hours**

EXPERIMENT 4

Implement C program using looping statements.

5 **4 Hours**

EXPERIMENT 5

Implement C program using arrays.

6 **4 Hours**

EXPERIMENT 6

Implement C program using string handling functions.

7 **6 Hours**

EXPERIMENT 7

Implement C programs using structures.

8 **4 Hours**

EXPERIMENT 8

Implement C programs using functions.

Total : 75Hours

Reference(s)

1. 1. Pradeep K. Sinha, Priti Sinha, Computer Fundamentals, BPB publications, 2008
2. 2. Ashok. N. Kamthane, Computer Programming, Second Edition, Pearson Education, 2012
3. 3. E.Balagurusamy, Programming in ANSI C, Tata McGraw-Hill, 2012
4. 4. Herbert Schildt, C -The complete Reference, Tata McGraw-Hill, 2013
5. 5. Byron Gottfried, Programming with C, Schaum's Outlines, Tata Mcgraw-Hill, 2013

18HS201 COMMUNICATIVEENGLISH II 1 0 2 2

Course Objectives

- Read and understand ideas of complex text on both concrete and abstract topics
- Listen and understand technical discussions in his/her field of specialisation
- Produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options
- Interact with a degree of fluency and spontaneity that makes regular interactionwithout strain

Programme Outcomes (POs)

i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Use appropriate grammar & vocabulary that is expected at the BEC Vantage exam level.
2. Outline the general meaning of non-routine letters, and of a report ofpredictable unpredictable topic
3. Show simple reports of factual nature and factual non-routine letters
4. Apply for factual information and do the answer; and take/pass onworkplace messages
5. Support opinions and present arguments to a limited extent; and give simple, prepared presentations on familiar topics

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1									1	-				
2									2	-				
3									3	-				
4										1				
5										3				

UNIT I **9 Hours**

GRAMMAR

Tenses - Future continuous, Future perfect, Future perfect continuous, Past perfect, Past perfect continuous - Adjectives and adverbs - Mixed conditionals - Modals - can't have, needn't have - Modals of deduction and speculation - Narrative tenses - Passives - Phrasal verbs, extended - Relative clauses - Reported speech - Will and going to, for prediction - Wish - Would expressing habits, in the past.

UNIT II **9 Hours**

READING

Scanning and reading for gist - Understanding text structure - Reading for gist and specific information - Vocabulary and structure - Understanding sentence structure and error identification

UNIT III **9 Hours**

WRITING

A message, memo or email, Giving instructions, explaining a development, asking for comments, requesting information, agreeing to requests - Business correspondence: explaining, apologising, reassuring, complaining, short report: describing, summarising - proposal: describing, summarising, recommending, persuading.

UNIT IV **9 Hours**

LISTENING

Listening for and noting specific information - Listening to identify topic, context, Function - Following the main points and retrieving specific information from the text.

UNIT V **9 Hours**

SPEAKING

Giving personal information: Talking about present circumstances, past experiences and future plans, expressing opinions, speculating - Organising a larger unit of discourse: Giving information and expressing and justifying opinions - Turn-taking: negotiating, collaborating, exchanging information, expressing and justifying opinions, agreeing/disagreeing, suggesting, speculating, comparing and contrasting, and decision-making.

Reference(s)

1. Guy Brook-Hart, "BEC Vantage: Business Benchmark Upper-Intermediate- Student's Books" 1st Edition, Cambridge University Press, New Delhi, 2006.
2. Ian Wood, Paul Sanderson, Anne Williams with Marjorie Rosenberg, "Pass Cambridge BEC Vantage- Student's Book" 2nd Edition, Cengage Learning, New Delhi, 2014
3. Michael Handford, Martin Lisboa, Almut Koester, Angela Pitt, "Business Advantage - Student's Book Upper-Intermediate" Cambridge University Press, New Delhi, 2014.
4. Cambridge Examinations Publishing, "Cambridge BEC VANTAGE - Self-study Edition", Cambridge University Press, UK, 2005.

18FT206 DESIGN THINKING 2 0 2 3

Course Objectives

- To enable students comprehend the fundamentals of design thinking process
- To impart knowledge of photography foundations for design
- To enable students conceptualize design developments and understand visual ethics

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering

problems.

b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

d. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Assess the fundamental concepts of design thinking.
2. Demonstrate knowledge of attributes of the color and their schemes applied in design.
3. Produce layouts for brochure design and calendar events applying grid theory.
4. Differentiate typography types by their style and appraise applications in various printed designs.
5. Demonstrate knowledge about the creative thinking process applied in design practice.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2
3	3	2		2									3	3
4	3	2											2	2
5	3	2											2	

UNIT I **6 Hours**

DESIGN FUNDAMENTALS

Design fundamental - Characteristics of a good design - Elements of design Line, Colour, Texture, Shape or form, Size. Principles of design - Balance, Harmony, Emphasis, Proportion, Rhythm. Creativity, importance of creativity, developing creativity.

UNIT II **6 Hours**

COLOR THEORY FOR DESIGN

Colour theory - introduction - basics of colour theory - attributes of colour - hue, value, saturation , tint - shade - colour wheel - colour harmony - colour schemes - achromatic, monochromatic, polychromatic, warm colours, cool colours, analogous colours, complementary colours, split complements, incongruous, triads and tetrads - colour blending - additive model, subtractive model - colour contrast - colour psychology.

UNIT III **6 Hours**

GRIDS AND LAYOUT

Grids and layouts - role of grids - structure - grid system and templates- layouts - layout guidelines - important parts of a page layout - factors influencing a layout -organizing layouts - capturing readers attention - visual composition - Collage.

UNIT IV **6 Hours**

TYPOGRAPHY

Typography - typeface anatomy, measurements - typeface classifications - type families - spacing and alignment selecting appropriate fonts - tips and techniques - Graphics -importance of graphics - types of graphics - vector graphics, raster graphics - vector file formats, raster graphic file formats, format conversion - crop and scale.

UNIT V **6 Hours**

CREATIVE THINKING PROCESS

Design process - approach - stages of design process - demonstrations and guidelines - Logo Design. Approach to design development – SCAMPER

1 **4 Hours**

EXPERIMENT 1

Create a Textile Print Patterns for Womens/Mens/Kids wear with appropriate layouts.

2 **6 Hours**

EXPERIMENT 2

Prepare the following Charts o Prang colour chart

- o Value Chart
- o Intensity Chart

3 **6 Hours**

EXPERIMENT 3

Illustrate print designs for the Elements of Design o Line

- o Colour
- o Texture
- o Shape or form
- o Size

4 **6 Hours**

EXPERIMENT 4

Illustrate Principles of Design o Balance in print

- o Harmony inprint
- o Emphasis inprint
- o Proportion in print
- o Rhythm in print

5 **8 Hours**

EXPERIMENT 5

Illustrate the colour harmony in dress design

o Monochromatic colour harmony
o Analogous colour harmony
o Complementary colour harmony
o Double complementary colour harmony
o Split complementary colour harmony
o Triad colour harmony

Total: 60 Hours

Reference(s)

1. Jeff Davis, Foundations of Design, Tempe Digital, 2016.
2. Vic Costello, Multinedia foundations: Core concepts for digital design, CRC press, 2016.
3. Judith wilde and Richard wilde, The process: A new foundation in Art and Design, Lawrence king, 2015.
4. Gavin Ambrose, Paul harris, Basics Design 08 - Design thinking, AVA publishing, 2009.
5. Alan pipes, Foundations for art and design, Lawrence king, 3rd edition, 2008.

18FT207 ENGINEERING PRACTICES LABORATORY 0 0 4 2

Course Objectives

- To demonstrate conceptualizing skills in developing decorative design ideas.
- To demonstrate fundamental concepts of braiding, crocheting and embroidery.
- To demonstrate skills for making coasters, greeting cards, table mats, wall hangings and handbags

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Create simple decorative articles used in everyday life.
2. Choose and apply painting materials and medium for producing painting artworks
3. Apply fundamental craft techniques of crocheting, braiding and embroidery for making decorative articles

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3				2								2	
2	3				2								2	
3	3				2								2	

1 **6 Hours**

EXPERIMENT 1

Development of Greeting card design using Indian script font.

2 **6 Hours**

EXPERIMENT 2

Development of Warli motifs and prepare painting.

3 **6 Hours**

EXPERIMENT 3

Development of saree embroidery pattern using any one of the Indian traditional embroidery techniques

4 **6 Hours**

EXPERIMENT 4

Development of madhubani theme wall decor items.

5 **6 Hours**

EXPERIMENT 5

Development of kalamkari style decor tea coasters and table mats

6 **6 Hours**

EXPERIMENT 6

Development of hand bag artwork using chikankari stitches

7 **6 Hours**

EXPERIMENT 7

Apply braiding technique and prepare handbag.

8 **6 Hours**

EXPERIMENT 8

Apply smocking technique and prepare the base for Indian injiri dress

9 **6 Hours**

EXPERIMENT 9

Development of crochet applique appropriate for hand bags

10 **6 Hours**

EXPERIMENT 10

Development of silk thread embroidery pattern for Womens apparel tops

Reference(s)

1. Natalie chanin, The Geometry of Hand-Sewing: A Romance in Stitches and Embroidery from Alabama Chanin and The School of Making (Alabama Studio), Abrams, 2017
2. Carol marine, Daily painting: Paint small and often to become a more creative, productive and successful artist, Watson-Guptill publications, 2014.
3. Alison Ellen, Hand knitting: new directions, 2nd edition, D&N publishing, 2011.

18FT301 ENGINEERING MATHEMATICS III **3 1 0 4**

Course Objectives

- Understand the concepts of Fourier series, Fourier and Laplace transforms which will enablethem to model and analyze the physical phenomena.
- Implement the Fourier analysis, an elegant method in the study of heat flow, fluid mechanicsand electromagnetic fields.
- Apply the numerical techniques to offer an approximate solution for the differential equations in a real world situation.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Problem Analysis: Identify, formulate, review research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

Course Outcomes (COs)

1. Apply the Fourier analysis for the periodicity and non-periodicity of combination of sine and cosine functions.
2. Differentiate partial differential equation and able to solve various equations.
3. Compute a function in frequency domain whenever the function is defined in time domain by Laplace transform.
4. Find the solution of system of linear equations by various numerical techniques.
5. Execute the numerical solution of initial and boundary value problems of differential equations by different methods.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	2												
2	1	2												
3	1	2												
4	1	2												
5	1	2												

UNIT I **12Hours**

FOURIER ANALYSIS

Review of Fourier series for periodic functions-Orthogonal functions-the Euler coefficient –Fourier transforms – properties of Fourier transform-Application of Fourier series and transform analysis.

UNIT II **12Hours**

LAPLACE TRANSFORM

Properties and theorems of Laplace transform - Shifting theorems - Convolution - Applications to ordinary differential equations - Applications to linear system analysis.

UNIT III **12Hours**

PARTIAL DIFFERENTIAL EQUATION

Introduction to partial differential equations - One-dimensional wave equation - Method of separation of variables-D'Alembert's solution of the wave equation. Heat equation. Laplace's equation.

UNIT IV **12Hours**

NUMERICAL SOLUTION OF SYSTEM OF LINEAR EQUATIONS

Solution of algebraic and transcendental equations: Fixed point iteration method - Newton- Raphson method - Solution of system of linear equations: Gauss elimination method - Inverse of a matrix: Gauss-Jordan method- Eigen values of a matrix by Power method.

UNITV **12Hours**

NUMERICAL SOLUTION OF DIFFERENTIAL EQUATIONS

Solution of first order ordinary differential equations: Euler's method - Fourth order Runge- Kutta method – Milne's predictor and corrector method - Solution of partial differential equations: Parabolic equations by Crank Nicholson method- Hyperbolic equations by explicit finite difference method.

References

1. Kreyszig Erwin, Advanced Engineering Mathematics, 7th Edition, John Wiley, 1993.
2. Johnson Richard A. and Bhaltacharyya Gouri K., Statistics, Principles and Methods, 3rd Edition, John Wiley, 1996.
3. O'Neil Peter V., Advanced Engineering Mathematics, 4th Edition, PWS-Kent, 1995.
4. James Glyn, Advanced Modern Engineering Mathematics, Addison-Wesley, 1993.
5. Milton J. S. and Arnold Jesse C., Introduction to Probability and Statistics: Principles and Applications for Engineering and the Computing Sciences, McGraw Hill Inc, 3rd Edition, 1995.

18FT302 PATTERNMAKING I **2 0 2 3**

Course Objectives

- Acquire knowledge on human body measurements and creating patternfrom the measurements.
- Develop commercial pattern with design aspect by manipulating the basic pattern.
- Fabricate patterns of different sizes by grading the basic pattern.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Evaluate the basic proportions of human body and determine the anthropometric measurement points.
2. Implement the pattern making techniques and terminologies applied in them.
3. Apply draping and flat pattern technique to draft patterns of basic bodice, sleeve, skirt and trousers.
4. Apply the principles of pattern making to manipulate the basic pattern according to the styles.
5. Generate style lines, altered and graded patterns.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2			3				1	1				
2	3	2							1	1				
3	3		3		2				1	1				
4	3		3		2				1	1				
5	3	3							1	1				

UNIT I **6 Hours**

ANTHROPOMETRY AND SIZE SYSTEMS

Anthropometry – Basic Measurements, Human Anatomy, Rule of Proportion-the human body: Height Weight distribution. Size Systems–Standards, Size charts.

UNIT II

PATTERN MAKING **6 Hours**

Patterns – Definition and Types- Individual and Commercial patterns. Pattern making – definition and types of pattern making- drafting, draping, flat pattern techniques. Pattern making – Tools and functions. Pattern Details, Trueing, blending, pattern grain line, balance line terms, notches, seam allowance, jog seam, dart points, pleats, flares, gather and true bias.

UNIT III **6 Hours**

PATTERN MAKING & DRAPING – BASIC SET

Drafting - Basic blocks for Men, Women and Kid – Bodice, Sleeve, Skirt and Trousers.

Draping – Tools used Basic blocks for Men, Women and Kid – Bodice, Sleeve, Skirt and Trousers.

UNIT IV **6 Hours**

PRINCIPLES OF PATTERN MAKING

Dart manipulation- Single dart series: slash-spread technique and pivotal transfer technique. Two dart series- slash spread and pivotal transfer technique. Graduated and radiating darts. Parallel, asymmetric and intersecting darts. Types of added fullness and Contouring Principle.

UNIT V **6 Hours**

STYLELINES, PATTERN ALTERATION AND GRADING

Style lines: Classic princess style line and variations, Armhole princess style line and variations, Panel Style line and variations. Pattern Alteration: Defects in pattern – Causes and remedies, checking for fit, Pattern alteration for fit. Grading: Grading process, grade rules, and types of grading system.

1 **3 Hours**

EXPERIMENT 1

Interpretation of the different types of body measurements like circumferential, vertical and horizontal measurements by taking body measurements from the human body and mannequin.

2 **4 Hours**

EXPERIMENT 2

Development of patterns by drafting and draping – Basic bodice and sleeve

3 **6 Hours**

EXPERIMENT 3

Development of patterns by drafting and draping – skirt and trousers.

4 **4 Hours**

EXPERIMENT 4

Single dart series: Slash spread technique & Pivotal transfer technique

5 **4 Hours**

EXPERIMENT 5

Double dart series: Slash spread technique & Pivotal transfer technique

6 **2 Hours**

EXPERIMENT 6

Drafting of style lines: Classic princess style line and variations.

7 **6 Hours**

EXPERIMENT 7

Drafting of style lines: Armhole princess style line and variations

8 **2 Hours**

EXPERIMENT 8

Drafting of style lines: Panel Style line and variations

9 **3 Hours**

EXPERIMENT 9

Grading of patterns – Manual method

Total: 60 Hours

Reference(s)

1. Helen Joseph Armstrong, ―Pattern Making for Fashion Design‖ Pearson Education (Singapore)Pvt. Ltd.,2005
2. Winifred Aldrich, ―Metric Pattern Cutting Blackwell Science Ltd., 1994
3. Amaden-Crawford Connie, ―The Art of Fashion Draping (3rd edition)‖ Om Books International Publications, 2005

4. Hollen Norma R; Kundel Carlyn, ―Pattern making by the flat pattern method‖, 1998
5. Gillian Holman,―PatternCuttingMadeEasy‖, Blackwell Scientific Publications, 1997.
6. Natalie Bray ―More Dress Pattern Designing‖ Blackwell Scientific Publications, 1986.
7. Gerry Cooklin, ―Master Patterns and Grading for Women‘s Outsizes‖, Blackwell Scientific Publications, 1995.
8. Gerry Cooklin, ―Master Patterns and Grading for Men‘s Outsize‖, Blackwell Scientific
9. Jeenne Price and Bernard Zamkoff, ―Grading Techniques for Modern Design Fairchild Publications, 1990.
10. https://www.patternreview.com

18FT303 APPARELMANUFACTURING I 2 0 2 3

Course Objectives

- To impart knowledge on various types of sewing machine settings and operating functions.
- To impart knowledge on the spreading and marker planning concepts along withcutting process parameters.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Analyse the basic spreading concepts and apply the different spreading techniques with reference to fabric design types.
2. Determine the marker planning parameters and apply the cutting machine specifications with reference to different cutting parameters.
3. Analyze the sewing machine working components and find the functions of them.
4. Analyze the operating mechanism of SNLS and the components coordinating the operation cycle.
5. Analyze the operating functions of flat lock machines and over lock machines.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	1	2		1				1	1				
2	2	1	3		1				1	1				

3	1	2	3		1				1	1				
4	1	2	3		1				1	1				
5	2	2	3		1				1	1				

UNIT I **5 Hours**

SPREADING CONCEPTS AND TECHNIQUES

Type of fabric packages received at garment industry, Manual spreading, Computerized spreaders, Spread relaxation, Types of spreads, NOW, NEW, NUD, Symmetrical and Asymmetrical patterns, effect on marker making.

UNIT II **7 Hours**

MARKER PLANNING AND CUTTING MACHINES

Marker plan preparation, marker efficiency, factors affecting marker efficiency, marker duplicating methods, computer aided marker making. Introduction to cutting machines, types and functions of cutting machines, straight knife, round knife, band knife cutting machines, notches, drills, die cutting machines; computerized cutting machines, common defects in cutting and their remedies.

UNIT III **6 Hours**

PARTS OF SEWING MACHINE

Basic parts of a sewing machine - needle, bobbin case/bobbin hook, loppers, loop spreader, threading fingers, throat plate, tongue chaining plates, take up devices, tensioner, feed dog, presser foot, folders and attachments. Types of needles, parts of needles and their function, needle size, sewing thread, properties of sewing threads, ticket number, fabric sewability,

UNIT IV **6 hours**

OPERATING FUNCTIONS OF SNLS

Classification of sewing machines - basic SNLS machine, parts and their functions, adjustments, stand height, pedal, needle bar, presser foot, feed dog, differential feed ratio, reverse feed, stitch length selection, feed timing, needle and bobbin thread tension, stitch cycle timing diagram, Maintenance of SNLS machine, Common defects and remedies.

UNIT V **6 Hours**

OPERATING FUNCTIONS OF FLATLOCK MACHINES AND OVERLOCK MACHINES

Over-lock and Flat-lock Sewing Machines: Loopers - eye and blind, spreader, Trimmers, Take-up devices: types, Stitch cycle timing diagram, Machine adjustments, Feeding mechanism-types and functions- drop, differential, belt, variable top and bottom feed, puller, needle feed and unison feed. Machine speed and rate of feed, stitch size regulation. Types, guides- arm, cylindrical and flat guides, folders and binders, types of presser foot & its functions.

FOR FURTHER READING

Stitching defects, Fabric defects, Pattern alteration in a garment, Hem for circular or flared skirts, Construction details of different styles, Front hip pocket.

1 **3 Hours**

EXPERIMENT 1

For the given fabric designs, plan the spreading technique to be adopted for executing the cut plan.

2 **3 Hours**

EXPERIMENT 2

Calculate the total spreading time per lay comprising of 80 plies for marker length 4m.

3 **3 Hours**

EXPERIMENT 3

Prepare a marker plan for the give cut order quantity and size breakup.

4 **3 Hours**

EXPERIMENT 4

Calculate the cutting time for lay of 7m length covering a total cutting perimeter of 560metres and 80 plies, if the CAM cutting head operates at an average speed of 2.5 meters per min. The cutting head stops for 1min every 30 minutes in between.

5 **3 Hours**

EXPERIMENT 5

Prepare illustrated examples of sewing needle positions in SNLS, Over lock machine, Flat lock machine Button sewing machine and Button hole making machine.

6 **3 Hours**

EXPERIMENT 6

Prepare a collection of sewing needles and sewing thread ticket no. Match the sewing thread count to sewing needle size for any four types.

7 **3 Hours**

EXPERIMENT 7

Illustrate SNLS machine stitch cycle timing diagram for all stages of one complete stitch.

8 **3 Hours**

EXPERIMENT 8

Illustrate the feed dog motion cycle for one cycle of stitch formation

9 **3 Hours**

EXPERIMENT 9

Illustrate the over lock machine looper threading layout

10 **3 Hours**

EXPERIMENT 10

Illustrate the Flat lock machine looper threading layout

Total: 60 Hours

Reference(s)

1. R.Rathinamoorthy & R.Surjit, Apparel Machinery and Equipment, Woodhead Publishing India in Textiles, New Delhi, 2015
2. Marie Clayton, "Ultimate Sewing Bible – A Complete Reference with Step-by-Step Techniques", Collins & Brown, London, 2008.
3. Carr and Latham's, Technology of Clothing Manufacture, 4th Edition, Om Books

International, New Delhi May 2008
4. Clair B. Shaeffer "The Complete Book of Sewing Shortcuts" Sterling Publishing Company, 1981.
5. Marry Mathew, Practical Clothing Construction Part I and II Basic Sewing Process, Cosmic Press, Chennai, 1999.
6. Claire Shaeffer, "Sewing for Apparel Industry", Prentice Hall, 2000.
7. Cooklin Gerry, "Garment Technology for Fashion Designers", Blackwell Science Ltd., 1997.

18FT304 FASHION SILHOUETTES 2 0 2 3

Course Objectives

- To enable Students understand and comprehend the fundamentals of visual art.
- To impart the knowledge of properties of lines, shapes, colors and compositions applied insilhouettes
- To enable the students develop fashion silhouettes in different styles.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
m. Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories. .
n. Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Assess the aesthetics of art and determine their characteristic features.
2. Analyse the principles of fashion silhouettes such as biomorphic forms, layered styles, wrapping styles, embellished garments, Asymmetrical silhouettes and structured garments
3. Analyse the principles of fashion silhouettes such as draping styles, body conscious dresses, Feminine patterns, movement, pattern and texture.
4. Outline the classification system of fashion silhouettes and appraise their salient features.
5. Evaluate the different types of ethnic silhouettes and critique them.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2
3	3	2		2									3	3
4	3	2											2	2
5	3	2											2	

UNIT I **6 Hours**

FUNDAMENTALS OF VISUAL ART

Different types of Art styles-Romantism, Neo classicism, Art deco, Modern art, Abstract expressionism, Surrealism, Pop art & Post modern Art. Aesthetics of art -subject view, composition view, content view and context view. Gestalt principles of perception.

UNIT II **7 Hours**

PRINCIPLES IN FASHION SILHOUETTES

Principles of fashion designing: embellishments, asymmetrical forms, biomorphic forms, structured garments, layering and wrapping styles.

UNIT III **6 Hours**

FASHION PRINCIPLES

Draping styles – flagging drape lines, fluid drape lines. Body conscious dresses, feminine patterns, movement and pattern, texture and motifs. Compression silhouettes – Compacting the body, following the exact shapes of the body.

UNITIV **6Hours**

CLASSIFICATION OF SILHOUETTES

Structural silhouettes – form that stands away from body and lines are created by shaping and seams. Fluid silhouettes – fabrics that flow over the body and follow the human form. Ornamentation – Creating details will enhance the form. Expansion silhouettes – exaggerating shapes formed away from the body.

UNIT V **5 Hours**

ETHNIC SILHOUETTES

Indian ethnic silhouettes – Men: Sherwani, Kurta-pyjama, Kurta-Dhoti, Angraks, Nehru collar. Women: Anarkali, Salwar kameez, Shararas, Ghararas, Lehenga Choli, Sarees. South East Asian women silhouettes – Ao Dai, Kimono, Cheongsam, Hanbok, Sarongs, Pareo, Gho, Tunic, Deel, Chut thai.

SELF STUDY

Preparation of style plan using any one principles of design -Illustrations, Color schemes and Accessories coordination plan, Student assignments on popular designers their lifestyle, their works and experiments.

1 **4 Hours**

EXPERIMENT 1

Collars and Necklines – Develop a mao neck top and halterneck dress. Compare the differences in neckline features.

2 **4 Hours**

EXPERIMENT 2

Shoulders and sleeves – Draw a grace jones style exaggerated shoulder pads silhouette and a sleeve with ruffles.

3 **4 Hours**

EXPERIMENT 3

Waistlines - Draw a low waist line silhouette and a high waist line silhouette. Resolve the illusion created by the position of waist band in determining the proportion of torso and legs.

4 **4 Hours**

EXPERIMENT 4

Closures – Draw a eighties style leather jacket emphasizing the zipper and cargo pocket with snap buttons

5 **4 Hours**

EXPERIMENT 5

Pleats and flounces – Draw Delphos: a tea gown of minutely pleated silk inspired by the ancient Greek chiton. Resolve the difference between pleat and flounce

6 **4 Hours**

EXPERIMENT 6

Gathering and draping – Draw a surplice wrap draped silhouette and harem pant.

7 **2 Hours**

EXPERIMENT 7

Decorative appliqués – Draw a manish arora's silhouette laced with beads, fringes, tassels and other metals.

8 **4 Hours**

EXPERIMENT 8

Accessories – Develop a 3D sketch of hand bag and shoe. highlight its values and tones.

Total: 60 Hours

Reference(s)

1. Andrew Graham dixon and Ian Chilvers, ART: The definitive visual guide, DK publishers, 2018.
2. Laura Volintesta, language of fashion design: 26 principles every fashion designer should know, Rockport publishers, 2014.
3. Alicia Kennedy, Emily stoehrer, Jay calderin, Fashion design referenced, Rockport publishers, 2013.
4. Macarena San martin, Fashion Details: 1000 ideas from neckline to waist line, pockets to pleats, Rockport publishers, 2011.
5. Celia Stall-Meadows, Fashion now: A global perspective, Prentice hall, 2010.
6. Https://www.instyle.com.

18FT305 BASICS OF FIBER, YARN AND FABRIC MANUFACTURING 3003

Course Objectives

- To learn and acquaint with the basics of yarn formation and fabric formation to supplement the subsequent learning of garment making and fashion portfolio development
- To learn the physical, mechanical and comfort properties of fibers.
- To learn and acquaint with the basics of yarn formation and fabric formation.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Differentiate the physical and chemical properties of textile fibers, production techniques (Both natural &manmade fibers) and its applications.
2. Outline the different types of mechanical and comfort properties of fibers and its measuring techniques.
3. Analyze the principles of preparatory process in spinning and comprehend their production and quality parameters.
4. Analyze the principles of modern spinning systems and comprehend their production and quality parameters.
5. Apply the principles of fabric formation in looms and differentiate the types of fabrics produced in them.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2												
2	3	1												
3	2	3												
4	2	3												
5	2	2												

UNIT I **9 Hours**

NATURAL AND MANMADE FIBERS

Introduction to fibres: Definition of Staple fibre and Filament, Yarn, and Thread. Classification - Natural fibres, Man-made fibres. Properties - essential properties, desirable properties. Production, cultivation and chemical properties of Natural Fibers: Cotton, Silk and wool. Production sequence, physical & chemical properties of Viscose Rayon, Polyester, Nylon. Applications of natural & man - made fibers.

UNIT II

MECHANICAL AN COMFORT

Degree of order, degree of orientation of molecular chains. Definitions: breaking strength, breaking extension, yield point, initial modulus, work of rupture and work factor. Stress-strain curves for various textile fibres and their significance. Definitions: humidity - Absolute humidity - Relative humidity - Moisture content, moisture regain. Factors influencing moisture regain - Conditioning of fibres. Static electricity, causes, problems and its elimination techniques.

UNIT III **9 Hours**

YARN MANUFACTURING

Fiber and yarn numbering system (count). Introduction about ginning, blow room, carding, combing, drawing, simplex and ring spinning system, processes, principle of operation and applications. Post spinning system, types and its application.

UNIT IV **9 Hours**

MODERN SPINNING SYSTEMS

Modern spinning systems: Definition and Classification - rotor spinning, friction spinning, air jet spinning, and bobtex spinning: processes, principle of operation, spinnability, output yarn quality characteristics, application areas and production capability -Comparison of modern spinning systems and their yarn quality parameters.

UNIT V **9 Hours**

FABRIC MANUFACTURING

Fabric Manufacturing: Definition - Classification of fabric forming methods: weaving, knitting, nonwovens: classification, processes, and principle of operation. Loom: Definition and Classification - Basic shuttle loom, shuttle less loom and other popular modern looms - Classification, principle of operation Rapier, Projectile, Air jet and Water jet.

DEVELOPMENTS AND OVERVIEW OF TEXTILE INDUSTRY

Natural fibers, high performance fibers, industrial application of fibers, production and consumption data of natural and man-made fibers, Latest fiber manufacturing technologies. Developments in spinning, weaving, knitting, nonwovens - Overview of textile industry.

Reference(s)

1. J.W.S. Hearle&W.E.Morton Physical Properties of Textile Fibers, Woodhead publishing, 4th Edition, ISBN 9781845694425, 2008
2. M. K. Talukdar, P. K. Sriramulu, and D. B. Ajgaonkar, Weaving: Machines, Mechanisms, Management, Mahajan Publishers Pvt. Ltd. 1998.
3. W. S. Murphy, Handbook of Weaving, Abhishek Publications, 2001.
4. Albrecht Wilhelm,Fuchs Hilmar, and Kittelmann Walter, Nonwoven Fabrics: Raw Materials, Manufacture, Applications, Characteristics, Testing Processes, 2002.
5. R. K. Dharmadhikary, T. F. Gilmore, H. A. Davis and S. K. Batra, Thermal Bonding of Nonwoven Fabrics, Textile Progress, Vol. 26, No.2, Textile Institute, 1995.
6. SabitAdanur, Wellington Sears Handbook of Industrial Textiles, Technomic Publishing Co. Inc. 2001.
7. https://www.fiber2fashion.com

18FT306 KNITTING TECHNOLOGY 3 0 0 3

Course Objectives

- To understand the basics of warp and weft knit structures and its derivatives.
- To comprehend the design for various knitted fabric structures
- To understand the knitting machine parameters for producing various knitted structures

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Analyze the warp knitted and weft knitted fabrics by interpreting their structure.
2. Distinguish between the various knitted fabrics
3. Determine the production of weft knitted fabrics by varying the fabric forming parameters.
4. Outline the working principles of warp knitting machines and the pattern of fabric formation.
5. Determine the production of warp knitted fabrics by varying the fabric forming parameters.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3												
2	2	2	1											
3	2	3												
4	2	2												
5	2	3	1											

UNIT I **9 Hours**

FUNDAMENTALS OF KNITTING

Introduction to knitting, Comparison of weaving and knitting, classification of warp and weft knitting machines, comparison of warp and weft knitted fabrics, elements of knitted loop structure. Symbolic, Graph paper and Diagrammatic representation of stitches. Knitting needles - Types, Knitting action, advantages and disadvantages

UNIT II **9 Hours**

WEFT KNITTING MACHINE

Elements of knitting machine - Cylinder, Sinker, Cam, Needle, Creel, Feeders - positive feeder, storage positive feeder, elastane feeder, take down mechanism. Patterning mechanism. Electronic devices for needle selection. Working principle of plain, rib, interlock and purl knitting machines. Formation of knit, tuck and float stitches. Effect of loop length.

UNIT III **9 Hours**

WEFT KNITTED STRUCTURES

Production of weft knitted fabric structures -Single jersey, Rib, Purl, Interlock. Derivatives of single and double jersey structures: plaited fabrics, 2X2 rib structure, half cardigan, full cardigan, Ponte-di-Roma, Ottoman rib, Texi- pique, Pin-tuck, Milano rib, French pique, Swiss pique. Applications of weft knit fabric, Common defects in weft knit fabric

UNIT IV **9 Hours**

WARP KNITTING MACHINE

Elements of Tricot and Raschel warp knitting machines - warp beam, guide bar, needle, needle bar, sinker, presser bar, links, and trick plate. Knitting cycle and working principles of Tricot and Raschel knitting machine. Pattern controlling mechanism - pattern wheels, pattern chains links, Electronic Jacquard.

UNIT V **9 Hours**

WARP KNITTED STRUCTURES

Representation of warp knit structures. Point Paper, Chain-Link Notation, single fabrics, Chain stitch, Tricot lap, Full tricot, Lock Knit, Reverse Lock Knit, satin, Loop raided fabrics, Queen's cord, Sharkskin, Blind lap. Applications of warp knit fabric, Common defects in warp knit fabric

FOR FURTHER READING

Latest developments in warp and weft knitting machines, Properties and applications of warp and weft knitted structures. Study of fleece fabrics. Study of knitted fabrics with Elastomeric yarn, 3D knitted fabric

Total : 45 Hours

Reference(s)

1. D. B. Ajgaonkar, Knitting Technology, Universal Publication Corporation, Mumbai, 1998
2. Anbumani N, Knitting Fundamentals, Machines, Structures and Developments,New Age International Private Limited, New Delhi, 2007.
3. Samuel Raz, Flat Knitting: The New Generation, MeisenbachGmbH, Bamberg, Meisenbach, 1991.
4. D Spencer, Knitting Technology, 3rd Edition, A Comprehensive Handbook and Practical Guide, Apr 2001,Woodhead Publishing, ISBN :9781855733336
5. K.F. Au, Advances in Knitting Technology,Woodhead Publishing, England 2011
6. https://nptel.ac.in/courses/116102005.

18FT307 FASHION ILLUSTRATION LABORATORY **0 0 4 2**

Course Objectives

- To make the students understand the basic concepts of fashion art and learning the aspects offashion rendering.
- To improve their skills in creating new designs anddresses.
- To develop their skills in fashion arts and creating innovative sketches
- Developing design improvisation of basics fashion rendering.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations

i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, andgive and receive clear instructions.

m. Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Generate the different body sections of human anatomy and plan different postures
2. Plan the fabric and colour application for developed fashion figures
3. Generate sketches in exclusive methods suitable for distinct presentations

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2			1				2	2			2	
2	1	2			3				2	2			2	
3	2	2			1				2	2			2	

1 **6 Hours**

EXPERIMENT 1

Illustration of stick figures, block figures and fleshing on block figures

2 **6 Hours**

EXPERIMENT 2

Figure analysis - Sketching of fashion figures in 8 ½ , 10 & 12 head proportions

3 **6 Hours**

EXPERIMENT 3

Face analysis – Sketching of facial shapes & features and hairstyles

4 **6 Hours**

EXPERIMENT4

Illustration of varied postures – front, back, side and ¾ profiles

5 **6 Hours**

EXPERIMENT 5

Colour rendering techniques – mixed media application

6 **6 Hours**

EXPERIMENT 6

Fabric rendering techniques – Wovens and knits

7 **6 Hours**

EXPERIMENT 7

Fabric rendering techniques – drape lines, pleats, gathers, surface ornamentation

8 **6 Hours**

EXPERIMENT 8

Illustration of Croquis – female

9 **6 Hours**

EXPERIMENT 9

Illustration of Croquis – male

10 **6 Hours**

EXPERIMENT 10

Illustration of Croquis – children

Total: 60 Hours

18FT308 COMPUTER AIDED TEXTILE DESIGN LABORATORY **0 0 4 2**

Course Objectives

- To train the students on developing basic fabric weaves and simulate their appearance
- To impart the knowledge of developing print designs appropriate for a concept.
- To equip them in developing concept boards, logo designs and brochure designs.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations

i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

m. Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Design fabric weaves and render them based on fashion trends.
2. Design different types of print designs for a concept.
3. Plan and prepare concept boards, logo designs and brochure designs for fashion communication.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2			3				2	2			3	
2	2	2			3				2	2			3	
3	2	2			3				2	2			3	

1 **6 Hours**

EXPERIMENT 1

Development of Plain and twill weave patterns with two color ways.

2 **6 Hours**

EXPERIMENT 2

Development of dobby blanket design with a color way.

3 **6 Hours**

EXPERIMENT 3

Development of an elaborate jacquard design with an extra warp and weft design for a stole

4 **6 Hours**

EXPERIMENT 4

Development of half drop all over print pattern of geometric motifs.

5 **6 Hours**

EXPERIMENT 5

Development of directional print of floral motifs.

6 **6 Hours**

EXPERIMENT 6

Development of t-shirt chest print design for a digital printing.

7 **6 Hours**

EXPERIMENT 7

Development of a typographical print design for a tote bag.

8 **6 Hours**

EXPERIMENT 8

Design a conceptual board based on a theme using a collage of images.

9 **6 Hours**

EXPERIMENT 9

Modify an existing logo of a brand.

10 **6 Hours**

EXPERIMENT 10

Develop a brochure design for a company featuring its product details and logo.

Total: 6 0 Hours

References

1. Fashion and Textile Design with Photoshop and Illustrator, Professional Creative Practice, Robert Hume, publication 2016, Fairchild books.
2. CAD for Fashion Design and Merchandising, Stacy Stewart Smith, publication 2014, Fairchild Books.
3. Learn Adobe Illustrator CC for Graphic Design and Illustration, Dena Wilson and Peter Lourekas with Rob Schwartz, Publication 2016.

18GE301 SOFT SKILLS VERBAL ABILITY 2 0 0 0

Course Objectives

- To help students gain adequate proficiency in vocabulary
- To read and understand unabridged text
- To help students become proficient in basic writing skills related to work place communication

Programme Outcomes (POs)

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Take up verbal ability part of the placement tests with confidence
2. Write with confidence in professional and workplace communication.
3. Distinguish fact from opinion by reading passages from a text

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1										2				
2										2				
3										2				

UNIT I 15 HOURS

INDTRODUCTION

Synonyms - Antonyms - Word Groups - Verbal Analogies - Etymology - Critical Reasoning - Cloze Test - One Word Substitution - Idioms and Phrases - Text & Paragraph Completion.

UNIT II 15 HOURS

BASICS OF VERBAL APTITUDE

Sentence Formation - Paragraph Formation - Change of Voice - Change of Speech - Reading Comprehension - Sentence Equivalence - Jumbled Sentences - Spotting Errors –Homophones. Homonyms - Commonly Mispronounced/Misspelt Words.

Total : 45 Hours

References

1. Murphy, Raymond. English Grammar in Use Ã¢?? A Self-Study Reference and Practice Book for Intermediate Learners of English. IV Edition. United Kingdom: Cambridge University Press. 2012.
2. Lewis, Norman. Word Power Made Easy. New York: Pocket Books. 1991.
3. Baronâ's The Official Guide for New GMAT Review, New Jersey: John Wiley & Sons, Inc. 2015.Kreyszig Erwin, Advanced Engineering Mathematics, 7th Edition, John Wiley, 1993.

18FT401 APPLIED MATHEMATICS 2 1 0 3

Course Objectives

- By enrolling and studying this course the students will be able to understand the basic concepts of probability and the distributions with characteristics and also two dimensional random variables
- Apply different statistical inference techniques in testing of hypothesis in a real time fashionindustry.
- Analyse the design in identifying the suitable product by comparing the characteristics of thematerial in industries.

Programme Outcomes (POs)

a.Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b.Problem Analysis: Identify, formulate, review research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

Course Outcomes (COs)

1. Apply the basic probability axioms and concepts, Probability distributions of the random variables in designing process.
2. Analyse the relationship and properties of two dimensional random variables using Correlation techniques in textile manufacturing.
3. Apply basic statistical inference techniques, including confidence intervals and hypothesis testing to science/engineering problems.
4. Design an experiment for an appropriate situation using ANOVA technique.
5. Compare statistical data in quality control by various control chart techniques.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	2												
2	1	2												
3	1	2												
4	1	2												
5	1	2												

UNIT- I **9 Hours**

PROBABILITY THEORY

Axioms of probability - Conditional probability - Baye's theorem - Random variable – Probability mass function - Probability density function –Moment Generating function-Binomial, Poisson and Normal distributions.

UNIT II **9 Hours**

TWO DIMENSIONAL RANDOM VARIABLES

Joint distributions - Marginal and Conditional distributions – Covariance - Correlation and Regression analysis in Textile Manufacturing.

UNIT III **9 Hours**

TESTING OF HYPOTHESIS

Sampling distributions – Estimation of parameters – Statistical hypothesis – Large sample test based on Normal distribution for single mean and difference of means –Small sample tests: t-test for mean- F- test - Chi-square test for Goodness of fit and Independence of attributes.

UNIT IV **9 Hours**

DESIGN OF EXPERIMENTS

One way and Two way classifications – Completely randomized design – Randomized block design – Latin square design.

UNIT V **9 Hours**

STATISTICAL QUALITY CONTROL

Control charts for measurements (X and R charts) – Control charts for attributes (p, c and np charts) – Tolerance limits – Acceptance sampling.

Total : 45 Hours

References

4. Johnson Richard A. and Bhaltacharyya Gouri K., Statistics, Principles and Methods, 3rd Edition, John Wiley, 1996.
5. Milton J. S. and Arnold Jesse C., Introduction to Probability and Statistics: Principles and Applications for Engineering and The Computing Sciences, McGraw Hill Inc, 3rd Edition, 1995.
6. James Glyn, Advanced Modern Engineering Mathematics, Addison-Wesley, 1993.
7. Kreyszig Erwin, Advanced Engineering Mathematics, 7th Edition, John Wiley, 1993.

18FT402 BASICS OF CHEMICAL PROCESSING 3 0 2 4

Course Objectives

- Apply fundamental knowledge on chemical processing of textiles.
- Learn and apply the method of application of pre-treatments / dyes / prints /finishing/ process.
- Demonstrate knowledge of the machinery used for pre-treatment / dyeing/printing/finishing/ process.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering

specialization to the solution of complex engineering problems.

b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

d. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Analyse the preparatory process and produce desized, scoured, bleached and mercerized fabric
2. Analyze the various dyeing machines and produce dyed fabrics with different dyes
3. Differentiate styles of printing, methods of printing and create printed fabrics.
4. Evaluate suitable mechanical and chemical finishing techniques for fabric
5. Analyze the color matching using spectrophotometer for measuring the quality of dyed material.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3	2						2	2				
2	2	3	2		1				2	2				
3	2	3	2						2	2				
4	2	2	2	2	1									
5	2	2	2	2	1									

UNIT I **9 Hours**

PREPARATORY PROCESSES

Introduction - Process sequence of wet processing for woven and knits. Singeing: plate singeing, roller singeing and gas singeing. Desizing hydrolytic, oxidative and enzymatic. Scouring alkaline and enzymatic. Bleaching - hypochlorite, peroxide and sodium chlorite bleaching. Optical whitening. Mercerizing: Hot and Cold mercerization, tension, tensionless and tubular mercerization.

UNIT II **9 Hours**

DYEING

Dyeing equipment - jigger, winch, soft flow, jet dyeing, J-box, padding mangles, package dyeing and

garment dyeing machine. Classification of dyes. Dyeing of cotton using natural, direct, reactive, vat and sulphur dyes. Dyeing of polyester using carrier, HTHP and thermo sol. Dyeing of cellulosicblends (one bath and two bath process). Kinetics and thermodynamics of textile dye absorption.

UNIT III **9 Hours**

PRINTING

Ingredients of print paste and their role in printing. Viscosity of print paste, Rheology properties and flow of print paste, Styles of printing - direct, discharge, resist, tie and dye and batik. Methods of printing - block, stencil, roller, rotary, flat bed, transfer and chest printing. Special prints -flock, foam, foil, glitter, khadi, leather, pearl and rubber. After treatments of printed goods. Troubleshooting in textile printing.

UNIT IV **9 Hours**

FINISHING

Mechanical finishing -raising, shearing, sueding, anti-shrink finish, compacting, decatizing, calendaring, embossing. Chemical finishing - softening, crease resist, biopolishing, flame retardant, water repellent, water proof, soil release, antimicrobial, UV protection finish. Denim washing - stone washing, acid washing, enzymatic washing and sand blasting.

UNIT V **9 Hours**

COMPUTER COLOR MATCHING CONCEPTS

Color; Electromagnetic spectrum - visible range, measurement of color strength - color matching - theory and applications. Spectrophotometer and color matching systems. Quality control using computerised color matching systems, color difference - pass / fail system and computerised shade sorting.

FOR FURTHER READING

Digital printing, Eco-labels, Banned chemicals, Environmental management system, Low wet pick-up techniques- Expression and topical techniques.

1 **3 Hours**

EXPERIMENT 1

Hydrolytic desizing and scouring of grey cotton fabric and assessment of the desized and scoured fabric

2 **3 Hours**

EXPERIMENT 2

Comparison of whiteness index and tenacity of peroxide and sodium hypochlorite bleached samples

3 **3 Hours**

EXPERIMENT 3

Assessment of rubbing and perspiration fastness of cotton fabrics

4 **3 Hours**

EXPERIMENT 4

Comparison of different ISO wash fastness tests on fabrics dyed with direct dyes

5 **3 Hours**

EXPERIMENT 5
Dyeing of cotton using direct / vat / reactive dyes

6 **3 Hours**

EXPERIMENT 6
Dyeing of polyester, nylon, polyester/ cotton and polyester / viscose

7 **3 Hours**

EXPERIMENT 7
Dyeing of silk yarn / fabric with acid dyes

8 **3 Hours**

EXPERIMENT 8
Printing of cotton fabric using direct or discharge styles.

9 **3 Hours**

EXPERIMENT 9
Printing of cotton fabric using resist style

10 **3 Hours**

EXPERIMENT 10
Bio polishing finish on denim fabric. Crease resistant finishing of cotton fabrics and measurement of dry and wet CRA

Total: 75 Hours

Reference(s)

1. D. Gopalakrishnan, Basics of Chemical Processing, Daya Publishing House, New Delhi, 2016.
2. E. R. Trotman, Dyeing and Chemical Technology of Textile Fibres, Charles Griffin and Co. Ltd., London. 1990.
3. V. A. Shenai, Technology of Bleaching and Mercerzing - Vol. III, Sevak Publications, Mumbai 1991.
4. V. A. Shenai, Technology of Dyeing - Vol. VI, Sevak Publications, Mumbai, 2000.
5. V. A. Shenai, Technology of Printing - Vol. IV, Sevak Publications, Mumbai 1996.
6. V. A. Shenai, Technology of Textile Finishing, Sevak Publications, Bombay, 1995.
7. http://nptel.ac.in/courses/116102016/

18FT403 APPARELMANUFACTURING II **2 0 2 3**

Course Objectives

- To impart knowledge on constructing the different types components like collars, sleeve,pocket, plackets used in garments.
- To impart the knowledge about different types of fabrics and it relation to garment cutting andsewing process.
- To Impart knowledge about different categories of garments and fasteners used in apparel

industry

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Apply the techniques involved in constructing the collar in different garments.
2. Apply the techniques involved in constructing the sleeves of different garments and assembly of woven shirts and trousers.
3. Select the seams suitable for knitted garments and resolve the factors affecting their seam performance.
4. Analyze the garment sewing defects and the possible remedies for improving seam quality.
5. Outline the preventive maintenance requirements of industrial sewing machines.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2	2		1				2	2				
2	2	2	3		1				2	2				
3	2	2	3		1				2	2				
4	2	3	2		1				2	2				
5	2	2	2		1									

UNIT 1 **6 Hours**

SEAMS IN COLLAR NAD YOKE CONSTRUCTION

Formal shirt collar construction steps, seams and stitches used, Difference in stitching collar with folder and without folder. Yoke construction steps, Seams and stitches used. Folders used in yoke construction. Issues in collar construction.

UNIT II **6 Hours**

SEAMS IN SLEEVE AND BODY CONSTRUCTION

Seams used in sleeve construction and construction steps of the same with folders and without folders.

Factors to be considered while sewing sleeves. Seams used in garment assembly of shirts and trousers. Factors affecting sewing performance of woven shirts and trousers.

UNIT III **6 Hours**

SEAMS FOR KNITTED GARMENTS

Superimposed seams, bound seams, flat seams, decorative seams and lap seams in knitted garments. Stitch classes used in knitting, Seam strength test and factors affecting seam strength in knitted garments. Seam slippage and factors affecting seam slippage in knits.

UNIT IV **6 Hours**

SEAM DEFECTS AND REMEDIES

Factors affecting sewability. Sewing defects in garments. Seam types and stitch density for children's apparel and Adult apparels. Acceptable seam puckering standards.

UNIT V **6 Hours**

TROUBLE SHOOTING SEWING MACHINE & CARE

Sewing machine remedies – avoiding breaking of needles, looped stitches, skipped stitches, upper thread breaking, lower thread breaking, puckered seams. Preventive maintenance for industrial sewing machine – General cleaning requirements, Lubrication, Periodical service.

FOR FURTHER READING

Folders used in profile sewing systems

1 **5 Hours**

EXPERIMENT 1

Prepare samples for Collars-peter pan, turtle neck, Chinese, shawl, shirt

2 **5 Hours**

EXPERIMENT 2

Develop samples for Sleeves –set in sleeve (Plain, Puff, Kimono & Raglan)

3 **4 Hours**

EXPERIMENT 3

Construct samples of Pockets-patch pocket, bound pocket and front hip pocket

4 **4 Hours**

EXPERIMENT 4

Design samples for Pockets-Patch pockets, Patch pockets with flap, Seam pockets

5 **4 Hours**

EXPERIMENT 5

Design samples of plackets Continuous bound placket,2-piece placket, tailors placket, fly opening

6 **4 Hours**

EXPERIMENT 6

Applying fullness in various parts of the children's wear.

7 **4 Hours**

EXPERIMENT 7

Application of seams in appropriate places based on garment types

Total : 60 Hours

Reference(s)

1. B. Claire and Shaeffer, Sewing for Apparel Industry, Pearson's Prentice Hall, New Jersey, 2000.
2. B. Claire Shaeffer& Glee Barre, High Fashion Sewing Secrets from the World's Best Designers: A Step- By-Step Guide to Sewing Stylish Seams, Buttonholes, Pockets, Collars, Hems, And More, Rodale Books Publisher, New York, 2001.
3. Marry Mathew, Practical Clothing Construction Part I, Basic Sewing Process, Cosmic Press, Chennai, 1999.
4. Cooklin Gerry, Garment Technology for Fashion Designers, Blackwell Science Publisher, USA, 1997.
5. Leila Aitken, Step by Step Dress Making Course, Sterling Publishing Co. Inc. NewYork, 1994.
6. www.fashiondex.com/Bubonia_Sample_1.pdf

18FT404 WOVEN FABRIC STRUCTURE AND DESIGN 2 0 2 3

Course Objectives

- To understand the various types of woven fabric structures
- To comprehend the design, draft and peg plan for various woven fabric structures
- To determine the suitability of loom requirements to produce fabrics with different structures

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Assess the elements of woven fabric structure and analyze their construction parameters
2. Differentiate the special rib and cord woven structures and analyze their construction parameters.
3. Apply the suitable looms to produce the various types of woven fabric structures
4. Analyze the formation techniques of pile fabric structures
5. Analyze the formation techniques of pile fabric structures and double cloth.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3							2	2				
2	2	3							2	2				
3	2	3							2	2				

4	2	2							2	2				
5	2	2							2	2				

UNIT I **6 Hours**

ELEMENTS OF WOVEN DESIGN AND ELEMENTARY WEAVES

Construction of elementary weaves- plain: warp rib, weft rib, mat, hopsack. Twills: modification of twills, Herring bone twill, broken twill, elongated twill, rearranged twills, diamond weaves. Satin - sateen and their derivatives.

UNIT II **6 Hours**

SPECIAL RIB AND CORD STRUCTURES

Ordinary and Brighton honey comb, Crepe weaves, Huck-a-back. Cork-Screw weaves, Bedford cords: plain faced, twill faced, Wadded, crepe-on. Welts & piques: wadded piques, Loose and fast back welts and piques. Mock-leno.

UNIT III **6 Hours**

COLOUR AND WEAVE EFFECTS

Color theory: light and pigment theory, modification of color, color combination, application of colors, color and weave effects. Spot figuring: arrangement of figuring for dobby and jacquard, Extra warp and extra weft figuring.

UNIT IV **6 Hours**

BACKED FABRIC PILE AND DOUBLE CLOTHS

Backed fabrics: Warp and weft back, reversible and non-reversible. Warp pile, fast wire pile, terry weaves, terry stripe and terry check. Weft pile: plain back, twill back velveteen, Lashed pile, corduroy, Weft plush.

UNIT V **6 Hours**

STITCHED DOUBLE CLOTHS

Double cloth: Classification, self-stitched, face to back, back to face, Combination face to back and back to face stitched double cloth. Wadded double cloth: weft and warp Wadded double cloth. Center warp & Weft Stitched double cloth. `

FOR FURTHER READING

Effect of different weaves on fabric properties, Braiding, Extra warp and extra weft figuring with multi-colour, Effect of Length, density and fatness on pile, 3D Fabrics, other types of double cloth.

1 **3 Hours**

EXPERIMENT 1

Analysis of Plain, Twill weave and Satin weaves

2 **3 Hours**

EXPERIMENT 2

Analysis of Huck-a-back and Honey Comb weaves

3 **3 Hours**

EXPERIMENT 3

Design, Draft and Peg plan of Mock Leno, Bedford cords

4 **3 Hours**

EXPERIMENT 4

Analysis of Extra Warp and Extra Weft Figuring

5 **3 Hours**

EXPERIMENT 5

Design, Draft and Peg plan of Double cloth, Pile Fabric

6 **3 Hours**

EXPERIMENT 6

Evaluation of Color and Weave Effects

7 **3 Hours**

EXPERIMENT 7

Design the set of parameters of a woven fabric for the given specific end-use

8 **3 Hours**

EXPERIMENT 8

Analyze the knitted fabric and state the end-uses.

9 **3 Hours**

EXPERIMENT 9

Sourcing and analysis of the given woven fabrics.

10 **3 Hours**

EXPERIMENT 10

Sourcing and analysis of the given woven fabrics.

Total: 60 Hours

Reference(s)

1. Grosicki Z. J., "Watson's Textile Design and Colour", Vol.1, Woodhead Publications, Cambridge England, 2004
2. Z. Grosicki, Watson's Textile Design and Colour, Universal Publishing Corporation, Mumbai, 1998.
3. E G Gilligan,Woollen and Worsted Woven Fabric Design, Woodhead publication,UK,2004
4. Seyam A. M., "Structural Design of Woven Fabrics, Theory and Practice", Textile Institute, Manchester, 2002
5. W. S. Murphy, Textile weaving & Design, Abhishek Publications, 2000
6. nptel.ac.in/courses/116102005/26.
7.

18FT405 PATTERNMAKING II **3 0 2 4**

Course Objectives

- Acquire knowledge on developing pattern style variants for body components.
- Develop patterns for commercial categories.
- Develop patterns for functional wear.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Evaluate the methods for drafting sleeve variants and collar variants.
2. Apply the procedure for drafting patterns for top wear garments and find the fine changes that needs to be incorporated in real production patterns.
3. Apply the procedure for drafting patterns for bottom wear and one piece garments and find the fine changes that needs to be incorporated in real production patterns.
4. Analyse the factors affecting knit wear patterns and intimate apparels and apply the methods of making them.
5. Determine the pattern making adjustments and changes required for manufacturing functional wear.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	3		2				2	2			2	2
2	3	2	3						2	2			2	2
3	3	2	3						2	2			2	2
4	3	2	3						2	2			2	2
5	3	2	3		2				2	2			2	2

UNIT I **9 Hours**

DRAFTING OF BODY COMPONENTS

Drafting of body components using slash and spread or pivotal transfer methods: Procedure
Sleeve: Set in sleeve- puff, bell, bishop, circular, leg-o-mutton, Juliet, petal, marmaluke, butterfly, cold shouldered sleeve. Raglan sleeves. Sleeve combined with bodice – kimono, dolman, Magyar/batwing. Collars: Flat collar, Shirt collar, Peter Pan collar, Sailor collar, Shawl collar.

UNIT II **9 Hours**

PATTERN MAKING – TOP WEAR

Top wear: Drafting & draping – Procedure for Formal shirt, Polo shirt, Single and Double breasted blazer, Kameez, Blouse, Ladies jacket.

UNIT III **9 Hours**

PATTERN MAKING – ONE PIECE WEAR & BOTTOM WEAR

One piece wear: Drafting & draping – Procedure for Jump suit, Romper and Dresses.
Bottom wear: Drafting & draping – Procedure for Denim trousers, Cargo shorts, Salwar, pants, knickers.

UNIT IV **9 Hours**

PATTERN MAKING – KNITS & INTIMATE APPAREL

Knit wear: Factors to be considered to draft knit wear. Intimate Apparel: Drafting & draping – Procedure for Vests, Brazier, Camisoles, Briefs, Boxers – briefs and shorts, Panty.

UNIT V **9 Hours**

PATTERN MAKING – FUNCTIONAL WEAR

Functional wear: Drafting & draping – Procedure for Sports/Active wear - Swim suit, Track suit. Chemical protective clothing - Lab coat. Medical functional clothing – Surgical gown, aprons. Cold weather protective clothing – Down jackets. Clothing for special needs.

1 **6 Hours**

EXPERIMENT 1

Drafting of patterns for different styles of sleeves and collars

2 **6 Hours**

EXPERIMENT 2

Drafting of patterns for Top wear:

1. Formal shirt and
2. Single breasted blazer

3 **7 Hours**

EXPERIMENT 3

Drafting of patterns for Bottom wear:

1. Denim trousers and
2. knickers

4 **5 Hours**

EXPERIMENT 4

Drafting of patterns for Bottom wear:

1. Vests and Briefs
2. Brazier

5 **6 Hours**

EXPERIMENT 5

Drafting of patterns for Functional wear:
Sports/Active wear - Swim suit.

Total: 75 Hours

Reference(s)

1. Helen Joseph Armstrong, ―Pattern Making for Fashion Design‖ Pearson Education (Singapore)Pvt. Ltd.,2005
2. Winifred Aldrich, ―Metric Pattern Cutting‖ Blackwell Science Ltd., 1994
3. Amaden-Crawford Connie, ―The Art of Fashion Draping (3rd edition)‖ Om Books International Publications, 2005

4. Hollen Norma R; Kundel Carlyn, ―Pattern making by the flat pattern method‖, 1998
5. Gillian Holman, ―PatternCuttingMadeEasy‖, Blackwell Scientific Publications, 1997.
6. Natalie Bray ―More Dress Pattern Designing‖ Blackwell Scientific Publications, 1986.
7. Gerry Cooklin, ―Master Patterns and Grading for Women‘s Outsizes‖, Blackwell Scientific Publications, 1995.
8. Gerry Cooklin, ―Master Patterns and Grading for Men‘s Outsize‖, Blackwell Scientific Publications, 1992.
9. Jeenne Price and Bernard Zamkoff, ―Grading Techniques for Modern Design‖ Fairchild Publications, 1990.
https://www.patternreview.com

18FT406 FASHION DESIGN CAD 2 0 2 3

Course Objectives

- To train the students on developing flat sketches of different apparels
- To impart the knowledge of developing Tech packs of industrial standards.
- To equip them to present their designs in rendered illustrations developed by using softwares.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
m. Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Assess the functions and tools of adobe illustrator
2. Create silhouettes for different categories in digital platform
3. Create story boards for different apparel categories of industrial standards.
4. Create and render trim boards for different types.
5. Create technical flat sketches of different apparel categories as per the industrial standards.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2			3				2	2			3	2
2	2	2			3				2	2			3	2
3	2	2			3				2	2			3	2
4	2	2			3				2	2			3	2
5	2	2			3				2	2			3	2

UNIT I **6 Hours**

FUNDAMENTAL TOOLS IN ILLUSTRATOR

Image formats. Tools. Create a new file. Create new layers. Prepare a file for export to jpeg format. Preparation of technical drawing. Pattern creation. Offset pattern repeats. Prepare pattern brushes. Masking. Creating new brush strokes.

UNIT II **6 Hours**

SILHOUETTES IN DIGITAL PLATFORM

Styling, Rib-top, Jackets, Yarn dyed stripe shirt, Skirts, Shorts, Dress, Background.

UNIT III **6 Hours**

STORY BOARDS

Croquis development, Adding effects to an illustration, working with text, Downloading fonts and clip art. Edit a photograph. Hand drawing. Color filling the garments. Changing the color of scanned fabric. Gradient editor.

UNIT I **6 Hours**

PREPARATION OF TRIM BOARDS

Zipper development. Changing zipper color and size. Brand label development. Size label development. embroidery pattern development. Develop button designs in different sizes.

UNIT V **6 Hours**

TECHNICAL FLAT SKETCHES

Formal shirts, trousers, jackets, Trench coats, Jump suits, Polo shirts, Swimsuits, Blazers.

SELF STUDY

Preparation of style plan using any one principles of design -Illustrations, Color schemes and Accessories coordination plan, Student assignments on popular designers their lifestyle, their works and experiments

1 **3 Hours**

EXPERIMENT 1

Develop a flat sketch of Men's full hand formal shirt with monochromatic soft floral prints.

2 **3 Hours**

EXPERIMENT 2

Develop a flat sketch of women's pleated skirt.

3 **3 Hours**

EXPERIMENT 3

Develop a flat sketch of Sequined Women's peasant blouse.

4 **3 Hours**

EXPERIMENT 4

Develop a flat sketch of Men's cargo pants.

5 **3 Hours**

EXPERIMENT 5

Develop a tech pack for a Boys T-shirt with a chest print.

6 **3 Hours**

EXPERIMENT 6

Develop a Tech pack for women's embroidered Kurti.

7 **3 Hours**

EXPERIMENT 7

Develop a Tech pack for All Over Printed Men's Joggers.

8 **3 Hours**

EXPERIMENT 8

Develop a Full Fashion Illustration of Women's denim trousers on a Croquis that is in trend and render it.

9 **3 Hours**

EXPERIMENT 9

Develop a Full Fashion Illustration of kid's casual wear on a Croquis and render it.

10 **3 Hours**

EXPERIMENT 10

Develop a Full Fashion Illustration of a Men's Croquis in formal wear and render it.

Total: 60 Hours

References

1. Robert Hume. Fashion and Textile Design with Photoshop and Illustrator, Professional Creative Practice. Fairchild books, 2016.
2. Stacy Stewart Smith. CAD for Fashion Design and Merchandising, Fairchild Books, 2014.
3. Dena Wilson and Peter Lourekas with Rob Schwartz Learn Adobe Illustrator CC for Graphic Design and Illustration. 2016.
4. Marianne Centner and Frances Verekar. Fashion designer's handbook for Adobe Illustrator. 2nd edition. A. John Wiley and Sons. 2011.
5. Kathleen Colussy and Steve Greenberg. Rendering fashion, fabric and prints. Pearson education. 2005.
6. https://www.bloomsbury.com/hume-textile-design

18FT407 GARMENTCONSTRUCTION I 0 0 4 2

Course Objectives

- To demonstrate conceptualizing skills in developing seam specifications.
- To demonstrate fundamental concepts of preparing sample seams.
- To demonstrate skills for making body components of garments.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Analyse the seam specification parameters for preparing samples
2. Create samples making use of garmenting techniques
3. Predict the technical problems faced in seam sample preparation.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2
3	3	2		2									3	3
4	3	2											2	2
5	3	2											2	

1 **6 Hours**

EXPERIMENT 1

Preparing samples for basic Hand stitches, Seams and Seam finishes with seam diagram and specification (cross section)

2 **6 Hours**

EXPERIMENT 2

Preparing samples for basic garmenting techniques: Fullness – Darts, Tucks, Pleats and Gathers

3 **6 Hours**

EXPERIMENT 3

Preparation of samples for Sleeves: Set in sleeve and cold shoulder sleeve.

4 **6 Hours**

EXPERIMENT 4

Preparation of samples for Collars: Shirt collar and Nehru collar.

5 **6 Hours**

EXPERIMENT 5

Preparation of samples for

Neckline finishes: Bias facing, Bias binding, fitted facing and French binding.

6 **6 Hours**

EXPERIMENT 6

Application of suitable neckline finishes and collars in men's wear with seam specification and seam diagram.

7 **6 Hours**

EXPERIMENT 7

Preparation of samples for Shawl collar with facing

8 **6 Hours**

EXPERIMENT 8

Preparation of yoke for men's wear formal shirt with seam diagram and specification.

9 **6 Hours**

EXPERIMENT 9

Construction of Formal shirt front placket and full sleeve placket.

10 **6 Hours**

EXPERIMENT 10

Construction of Blazer notch collar with specification

Reference(s)

4. Natalie chanin, The Geometry of Hand-Sewing: A Romance in Stitches and Embroidery from Alabama Chanin and The School of Making (Alabama Studio), Abrams, 2017
5. Carol marine, Daily painting: Paint small and often to become a more creative, productive and successful artist, Watson-Guptill publications, 2014.

18FT408 TESTING AND QUALITY CONTROL LABORATORY 0042

Course Objectives

- To understand working principles/ procedures of various textile testing instruments
- To test the fibre, yarn, fabric and accessories.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering

specialization to the solution of complex engineering problems.

b. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

d. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Differentiate the textile fibers by using fiber identification tests.
2. Assess the essential & desirable properties of fibers, yarn & fabric.
3. Analyze the properties of both woven & knitted fabrics.
4. Analyze the performance related properties of apparels and accessories.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3	2	1						2				
2	2	3	2	1						2				
3	2	3	2	1						2				
4														

1 **6 Hours**

EXPERIMENT 1

Fibre identification tests by microscopic, burning and chemical tests.

2 **6 Hours**

EXPERIMENT 2

Analysis of Cotton fibre length (Baer Sorter)

3 **6 Hours**

EXPERIMENT 3

Measurement of Fibre fineness (air-flow)

4 **6 Hours**

EXPERIMENT 4

Measurement of single yarn twist

5 **6 Hours**

EXPERIMENT 5

Measurement of yarn strength: Lea strength

6 **6 Hours**

EXPERIMENT 6

Testing of fabric thickness, stiffness and crease recovery

7 **6 Hours**

EXPERIMENT 7

Testing of fabric tensile strength, tearing strength and bursting strength

8 **6 Hours**

EXPERIMENT 8

Measurement of Shrinkage in Knitted Fabric

9 **6 Hours**

EXPERIMENT 9

Analysis of fabric abrasion resistance and fabric pilling of various GSM

10 **6 Hours**

EXPERIMENT 10

Measurement of seam strength and button strength

18HS001 ENVIRONMENTAL SCIENCE 2 0 0 0

Course Objectives

- Review the interdisciplinary and holistic nature of the environment
- Understand how natural resources and environment affect the quality of life and stimulate thequest for sustainable development
- Analyze the socio-economic, political and ethical issues in environmental science

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Course Outcomes (COs)

1. Assess the importance of interdisciplinary nature of environment studies, uses and exploitation of natural resources.
2. Analyze the different types of ecosystems and biodiversity, its values and also role of professionals in protecting the environment from degradation.
3. Assess the existing environmental challenges related to pollution and its management.
4. Select suitable strategies for sustainable management of components of environmental
5. Integrate the impacts of population and human activities on environment.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	2												
2	1	1												
3	2	2					1							
4	1													
5	2													

UNIT I **6 Hours**

NATURAL RESOURCES

Forest resources: Use - over exploitation - deforestation - case studies. Water resources: Use - over utilization of surface and ground water - conflicts over water. Mineral resources: Use - exploitation - environmental effects of extracting and using mineral resources - case studies. Food resources: Effects of modern agriculture - fertilizer- pesticide problems (eutrophication, blue baby syndrome, bio magnification) - water logging - salinity - case studies. Energy resources: renewable (solar, wind, tidal, geothermal and hydroelectric power) - non renewable energy sources.

UNIT II **6 Hours**

ECOSYSTEMS AND BIODIVERSITY

Concept of an ecosystem: Structure and function of an ecosystem - producers - consumers - decomposers - food chains - food webs and ecological pyramids - Types of ecosystem: Introduction - characteristic features: forest ecosystem - desert ecosystem - ecological succession. Biodiversity - value of biodiversity - threats to biodiversity - endangered and endemic species - Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity - field study.

UNIT III **6 Hours**

ENVIRONMENTAL POLLUTION

Pollution: Definition - causes - effects - control measures of air pollution - water pollution: (Sewage water treatment by activated sludge and trickling filter process) - marine pollution - thermal pollution - noise pollution. Disaster management: causes - effects - control measures of floods - earthquake - cyclone – landslides.

UNITIV **7 Hours**

SOCIAL ISSUES AND ENVIRONMENT

Sustainable development: Definition - Unsustainable to sustainable development - urban problems related to energy. Environmental ethics - issues and possible solutions - solid waste management - causes - effects - 3R Principles (landfills, incineration, composting). Water conservation - rain water harvesting - watershed management. Climate change - global warming - acid rain - ozone layer depletion. Environment protection act: Air (Prevention and control of pollution) act - wildlife protection act.

UNIT V **5 Hours**

HUMAN POPULATION AND ENVIRONMENT

Human population: Population growth - characteristics - variation among nations - population explosion - women and child welfare programmes - value education - HIV / AIDS. Role of information technology in environment and human health - occupational safety and health administration (OSHA)

FOR FURTHER READING

Human rights: E - waste and biomedical waste -Identification of adulterants in food materials

Total: 30 Hours

Reference(s)

1. Anubha Kaushik, C.P. Kaushik, Environmental Science and Engineering , 4th Multi Colour Edtion, New Age International Publishers, New Delhi, 2014
2. A. Ravikrishnan, Environmental Science and Engineering, 5th revised Edition, Sri Krishna Hitech Publishing company (P) Ltd, Chennai, 2010
3. T. G. Jr. Miller, S. Spoolman, New Environmental Science, 14th Edition, Wadsworth Publishing Co, New Delhi, 2014
4. E. Bharucha, Textbook of Environmental studies, second Edition, Universities Press Pvt. Ltd., New Delhi, 2013
5. A. K. De, Environmental Chemistry, 7th Edition , New age international publishers, New Delhi, 2014

18GE401 SOFT SKILL BUSINESS ENGLISH 2 0 0 –

Course Objectives

- To acquire command of both the receptive skills (Listening, Reading) and the productive skills (Writing and Speaking) of English language.
- To understand and make effective use of English language in business contexts

Programme Outcomes (POs)

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Listen, Read, Speak, and Write Business English at the level of independent users.
2. Appear for the Business English Certificate (BEC) Vantage level examination conducted by the Cambridge Assessment English

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1										2				
2										3				

UNIT 1 **15 Hours**

LISTENING AND READING

Listening for writing short answers - filling gaps in sentences - identifying topic, context and function - identify different functions of language in business situations - identify prompts identify paraphrases of required information Scanning - reading for gist - understanding sentence structure - error identification - identify paraphrases - cohesive words and phrases - understand the importance of analysing the distractors - identify grammatical and semantic relationships.

UNIT II **15 Hours**

WRITING AND SPEAKING

Business Emails - notes - memos to colleagues or friends - Giving instructions - explaining a development - asking for comments - requesting information - agreeing to requests - explaining apologizing - reassuring – complaining describing - summarizing - recommending – persuading Turn-taking - sustaining interaction - initiating - responding - giving personal information Talking about present circumstances, past experiences and future plans - expressing opinion speculating - organizing a larger unit of discourse - giving information - expressing and justifying opinions - speculating - comparing and contrasting - agreeing and disagreeing.

Total: 30 Hours

Reference(s)

1. Whitehead, Russell and Michael Black. Pass Cambridge BEC Vantage Self - study Practice Tests with Key, Heinle - a part of Cengage Learning, Delhi, 2003.Elaine Stone, Fashion Merchandising – An Introduction, Fourth Edition.

18FT501 FASHION MERCHANDISING AND MARKETING 3 0 0 3

Course Objectives

- To understand the fashion merchandising and marketing process in apparel business.
- To comprehend the various types of merchandising in apparel business
- To exemplify the marketing research and product launching in apparel industry.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
f. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
h. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
k. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
l. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
m. Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyse the different merchandising terms, functions and interpret the merchandising requirements of different groups of buyers.
2. Analyze the process flow in merchandising and the responsibilities of merchandisers in order execution.
3. Assess market research, data collection techniques for inferring statistical results in apparel market research.
4. Assess the market research techniques
5. Evaluate the industrial buying and sourcing process of apparel.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2										3		1
2	2	2						2		2				1
3	2	3			2							2		1
4	2	2									2			1
5	2					2						2		1

UNIT 1 **9 Hours**

INTRODUCTION TO MERCHANDISING

Merchandising terminology –supplier, sub-contractor, direct order, merchant export, Evaluation of sub-contractors, vendors in evaluation, CM and CMT. Need of merchandising- advantages and disadvantages. Different forms of merchandising, Functions and tools of Merchandising.

UNIT 2 **9 Hours**

PROCESS FLOW IN MERCHANDISING

Teck Pack – Importance and contents of Tech pack, merchandisers' perspective of tech pack. Sampling – Importance of sampling, different forms of sampling. Approvals- Types of approvals. Pre-Production meeting, Production scheduling – Preparation of BOM, Time and Action calendar, Fabric and trims consumption. Time management in merchandise.

UNIT 3 **9 Hours**

FASHION MARKETING

The concept of fashion marketing. Types and methods of market research. Fashion marketing - Purpose of market research, an overview of the marketing research process, data sources. Fashion marketing communications, Sales forecasting. Marketing mix- 4 P's.

UNIT 4 **9 Hours**

MARKET RESEARCH TECHNIQUES

Market segmentation- behavioral, demographic, geographic. Types of sampling- cluster, convenience, judgment, quota, simply random sampling, systematic sampling**.** Techniques – interviews, attitude, likert scale, projective scales, observation.

UNIT 5 **9 Hours**

FASHION BUYING PROCESS AND SOURCING

Buying process- Buyer behavior, aspects of buying process, buying decision process. Pricing strategy, selection of distribution channel. Sourcing- types and process of sourcing, factors affecting sourcing, types of suppliers. Costing- components of cost of garment.

Total : 45 Hours

Reference(s)

1. Dr. V.R. Sampath, Garment Marketing and Merchandising, Published by Kalaiselvi Pathippakam.
2. Elaine Stone, Fashion Merchandising– An Introduction, Fourth Edition.
3. Virginia Grose, Basics Fashion Management 01: Fashion Merchandising, AVA publiser,switerland, 2011
4. Philip Kotler, Principles of Marketing, Pearson Education India, 2008.
5. Fashion Merchandising: Principles and practice by James Clark, published by Palgrave Macmillan, 2014
6. www.vasantkothari.com

18FT502 INDIAN TRADITIONAL EMBROIDERY 3 0 2 4

Course Objectives

- To introduce the technique(s) of Indian traditional embroidery for value addition.
- To create awareness about the different embroidered textiles of India.
- To initiate identification of regional embroideries developed by various communities.
- To understand the origin of technique and design with reference to colors, motifs, stitches ofdifferent Indian traditional embroidery.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

g. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

l. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

m. Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory
of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

n. Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyze the specific embroidery style of Northern India on the basis of region, technique, motifs, Materials, colors, stitches, style of embroidery and Applications.
2. Analyze the specific embroidery style of Western India on the basis of region, technique, motifs, Materials, colors, stitches, style of embroidery and Applications.
3. Analyze the specific embroidery style of Central India on the basis of region, technique, motifs,Materials, colors, stitches, style of embroidery and Applications
4. Analyze the specific embroidery style of Southern India on the basis of region, technique, motifs, Materials, colors, stitches, style of embroidery and Applications.
5. Analyze the specific embroidery style of Eastern India on the basis of region, technique, motifs, Materials, colors, stitches, style of embroidery and Applications.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2				2		3					2	3	2
2	2				2		3					2	3	2
3	2				2		3					2	3	2
4	2				2		3					2	3	2
5	2				2		3					2	3	2

UNIT 1 **9 Hours**

TRADITIONAL EMBROIDERY – NORTHERN INDIA

Kashida from Kashmir, Phulkari from Punjab, Chamba rumal from Himachal Pradesh – region, technique, motifs, Materials, colours, stitches, style of embroidery, Applications.

UNIT 2 **9 Hours**

TRADITIONAL EMBROIDERY –WESTERN INDIA

Embroidery from Gujarat, Parsi embroidery - region, technique, motifs, Materials, colours, stitches, style of embroidery, Applications.

UNIT 3 **9 Hours**

TRADITIONAL EMBROIDERY –CENTRAL INDIA

Chikkankari from Uttar Pradesh, Phool Patti ka Kaam from Uttar Pradesh, Zardozi from Uttar Pradesh-region, technique, motifs, fabric, Materials, stitches, style of embroidery, Applications.

UNIT 4 **9 Hours**

TRADITIONAL EMBROIDERY: SOUTHERN INDIA

Kasuti from Karnataka, Lambadi embroidery from Andhra Pradesh - region, technique, motifs, fabric colours, stitches Materials, colours, stitches, style of embroidery, Applications.

UNIT 5 **9 Hours**

TRADITIONAL EMBROIDERY: EASTERN INDIA

Kantha from West Bengal, Sujani from Bihar, Pipli appliqué from Orissa - region, technique, motifs, Materials, colours, stitches, style of embroidery, Applications.

1 **3 Hours**

EXPERIMENT 1

Prepare a report showing the origin of Indian traditional embroidery

2 **3 Hours**

EXPERIMENT 2

Collect the swatches and images on each type of traditional embroidery and make a scrap book.

3 **3 Hours**

EXPERIMENT 3

Design and develop a religious costume of any Indian traditional embroidery by incorporating the motifs of the same.

4 **3 Hours**

EXPERIMENT 4

Design and develop a sample for Ladies Kurti showing the motifs of any two Indian traditional embroidery.

5 **3 Hours**

EXPERIMENT 5

Design and develop a sample for Boys pajamas showing the motifs of any two Indian traditional embroidery.

6 **3 Hours**

EXPERIMENT 6

Design and develop a sample for Kids Frock showing the motifs of any two Indian traditional embroidery.

7 **3 Hours**

EXPERIMENT 7

Prepare a sample of any one traditional embroidery on 4”x4” fabric with a design size of 2”x2”. Indicate the fabric used, type, size of needle and type of thread and amount of all material consumed for the same.

8 **3 Hours**

EXPERIMENT 8

Design a lifestyle product using any one traditional embroidery.

9 **3 Hours**

EXPERIMENT 9

Collect traditional embroidery motifs and create designs from collected motifs using Software.

10 **3 Hours**

EXPERIMENT 10

Collect traditional embroidery motifs and transform into digital form.

Total : 75 Hours

Reference(s)

1. Shailaja D.Naik, S. (1996). Traditional Embroideries of India. A.P.H. Publishing Corporation, N.Delhi.

2. Mary E Waring (2017), Handbook of Traditional Embroidery.
3. Mary Gostelow (1989), Embroidery – Traditional designs, techniques, and patterns from all over the world.
4. Jangir, S. (2016). Digital embroidery designing: A new opportunity for textile designer. International Journal of Home Science. 2(3).
5. Veenu. (2016). Symbolic motifs in Traditional Indian Textiles and Embroideries, International Journal of Research in Economics and Social Sciences. 6(3)
6. https://sewguide.com/indian-embroidery-patterns
7. https://www.livemint.com/Leisure.

18FT503 FASHION DESIGN PROCESS **3 0 2 4**

Course Objectives

- To enable Students identify end user design needs and expectations
- To impart the knowledge of conceptualizing designs and present them.
- To enable students prototype the concepts.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyse trend analysis techniques and resolve the design requirements.
2. Apply design research methodologies and execute design developments.
3. Create thematic mood board and develop silhouettes.
4. Evaluate constituents of fabric and determine the fabric specification.
5. Create patterns and construct design.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2			2			2				2	2	
2	3	2			2			2				2	2	3
3	2	2	3					2					2	3
4	3	2	2					2					2	3
5	2	2	3					2					2	3

UNIT I **9 Hours**

FASHION TRENDS AND FORECASTING

Fashion cycle, trend analysis techniques, types of forecasting, Color forecasting process – Key colors. Social and Cultural aspects. Consumer segmentation based on Psychographic profiles.

UNIT II **9 Hours**

FASHION DESIGN RESEARCH METHODOLOGY

Design process - approach - stages of design process - demonstrations and guidelines – Fashion Design. Approach to design development – SCAMPER

UNIT III **9 Hours**

CONCEPTUALIZATION AND SILHOUETTE DEVELOPMENT

Development of designs and silhouettes, Concept editing and finalization, mood board creation processes, color story creation processes. Types of fashion looks - classic, bohemian, casual, eclectic, minimalistic and sporty.

UNIT IV **9 Hours**

FABRIC SPECIFICATION

Classification of fabric types: woven fabric categories and knitted fabric categories. Fabric specification development: color specification, weight specification, drape specification.

UNITV **9 Hours**

PROTOTYPE DEVELOPMENT

Pattern development processes - draping & alterations, Flat sketches. Story board preparation. Fashion photoshoot. Look book contents.

SELF STUDY

Design development folder preparation - Inspiration, Illustration board, Fabric board, Client board, Mood board. Real Pattern preparation and sample preparation for one look.

1 **6 Hours**

EXPERIMENT 1

Create a inspiration journal, brainstorm, visualize and focus

2 **6 Hours**

EXPERIMENT 2

Develop thematic mood board and color board with palette

3 **6 Hours**

EXPERIMENT 3

Visualize and develop silhouettes (minimum 30 silhouettes of any chosen garment)

4 **6 Hours**

EXPERIMENT 4

Show color story of the chosen silhouette and draft patterns for the same.

5 **8 Hours**

EXPERIMENT 5

Construct the chosen silhouette

Total: 75 Hours

Reference(s)

1. Anette Fischer and Kiran Gobin, Construction for fashion design, Bloomsbury, 2017.
2. Karl Aspelund, The design process, Fairchild, 2015.
3. Amolie Claude and Valerie Praguin, The collection process: fashion design process 4, Esmod editions, 2012.
4. Mckelvey and J. Munslow, Fashion design: process, innovation and practice, John wiley and sons, 2nd edition, 2011.
5. Simon Seivewright, Basics Fashion Design 01: Research and Design, A & C Black, 2nd edition, 2012.
6. John Hopkins, Fashion Design: The Complete Guide, A & C Black, 2012.
7. Www.29andseptemberstudio.com

18FT504 QUALITY ASSURANCE IN GARMENT PRODUCTION 3003

Course Objectives

- Students will have fundamental knowledge on quality and quality standards.
- Students will know the methodology of quality assurance in the apparel industry.
- Students will apply statistical tools in the apparel industry.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
c. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

d. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

f. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

f. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Course Outcomes (COs)

1. Evaluate the fundamentals of quality concepts and choose quality tools and inspection for each garment manufacturing stage.
2. Integrate the specifications of quality standards and resolve the testing requirements of different organization protocols.
3. Apply the quality inspection system procedures for fabric and accessories and implementthem for carry out sample inspections.
4. Determine tolerance limits for garment manufacturing processes and design standard operating procedures.
5. Analyse the costs of quality and determine the product care and safety requirements for different garments.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2	1		1	2								
2	2	2	1				2	2						
3	2	3	2			1								
4	2	3	1											
5	2	3	1				2	2						

UNIT I **9 Hours**

FUNDAMENTALS

Quality: Definition, Dimensions & its importance. Inspection: Inspection loop, Systems of inspection, Types of inspection, Quality Control, Quality Assurance, Quality Management, Operating characteristic curve: Producers risk, Consumers risk, AQL, LTPD. Q-7 tools and its application.

UNIT II **9 Hours**

QUALITY STANDARDS, SYSTEMS AND INSPECTION AGENCIES

Quality Standards: AATCC, ASTM, BIS, ISO, CSE. ISO 9001, ISO 14001, OHSAS 18000:2000, GOTS, CPS (Children Protection Standards), Social Compliance. Inspection agencies: Government and private agencies, third party testing / inspection services, AEPC, Textiles Committee, Test and inspection report.

UNIT III **9 Hours**

QUALITY ASSURANCE IN FABRICS AND ACCESSORIES

Establishing spec sheet for raw materials and accessories, Types of defects in fabrics, major and minor faults, Fabric grading & inspection systems: types, 4 point and 10 point, sampling procedure, prescribing inspection procedure for raw materials and accessories. Tolerance limits and quality standards for fabrics, other raw materials and accessories.

UNIT IV **9 Hours**

QUALITY ASSURANCE IN APPAREL PRODUCTION

Standard Operating Procedure (SOP), Prescribing specifications for process and machines: Spreading, Pattern Making, Cutting, Bundling, Ticketing, Stitching, Pressing / Finishing. Care labeling of apparel: Standards and methods. Safety issues for different accessories in children garment, prescribing inspection procedures for process and finished garment. Tolerance limits and quality standards for cutting, sewing and finished garments.

Total: 45 Hours

Reference(s)

1. Janace E. Bubonia, Apparel Quality: A Guide to Evaluating Sewn Products, Bloomsbury Publishing, 2014.
2. Quality Management Handbook for the Apparel Industry, Clothing trade, New Age International Publishers, 2012
3. Subrata Das, Quality Characterization of apparel, Woodhead Publishing.2010.
4. Douglas C. Montgomery, Statistical Quality Control: A Modern Introduction, 6th edition, Wiley India Pvt. Limited, 2010.
5. Sara J Kadolph, Quality Assurance for Textiles and Apparel, Fairchild Publications Inc., Chicago, 2007.
6. www.astm.org

18FT507 APPAREL CAD I (LABORATORY COURSE I) **0 0 4 2**

Course Objectives

- To impart them knowledge in identifying the pattern making tools used in Lectra software anddevelop efficient patterns.
- To equip them in developing different garment patterns and grading the patterns in efficient manner.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Analyse the tools and applications of Lectra software (Pattern making and grading software)
2. Create the "basic pattern set" patterns in Lectra software.
3. Create the patterns and grade them into different sizes.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	1			3					1				
2	2	1			3					1				
3	2	1			3					1				

1 **6 Hours**

EXPERIMENT 1

Identification of primary tools for navigation of Lectra modari's interface.

2 **6 Hours**

EXPERIMENT 2

Construct the pattern for Basic Bodice front & back. (Refer the standard measurement

3 **6 Hours**

EXPERIMENT 3

Construct the pattern for Basic sleeve (refer the standard measurement)

4 **6 Hours**

EXPERIMENT 4

Draft the pattern for Basic skirt front and back (refer the standard measurement)

5 **6 Hours**

EXPERIMENT 5

Draft the pattern for Trouser front and Back (refer the standard measurement)

6 **6 Hours**

EXPERIMENT 6

Design a baba suit and draft the pattern, seam them and grade them into three different sizes.

7 **6 Hours**

EXPERIMENT 7

Draft a pattern for frock, develop a style variant of the drafted pattern, seam them and grade in three sizes.

8 **6 Hours**

EXPERIMENT 8

Draft a women's top, seam them and grade them into three different sizes

9 **6 Hours**

EXPERIMENT 9

Draft the men's formal shirt pattern and grade them into different four sizes.

10 **6 Hours**

EXPERIMENT 10

Draft a men's trouser pattern, develop three different leg fits from it, seam the patterns and grade them in three inseam lengths

Total: 60 Hours

18FT508 GARMENTCONSTRUCTION II **0 0 4 2**

Course Objectives

- To demonstrate skills in sewing different types of seams.
- To demonstrate skills in constructing commercial garment categories
- To demonstrate skills in finishing garment samples

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Analyse seam specifications of commercial garment categories.
2. Evaluate and apply sewing techniques in constructing the garment.
3. Apply fundamental concepts and prepare technical specifications.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3				2					2			2	
2	3				2					2			2	
3	3				2					2			2	

1 **6 Hours**

EXPERIMENT 1

Construction of Polo shirt with suitable seam specification and seam diagrams.

2 **6 Hours**

EXPERIMENT 2

Construction of long coat with suitable seam specification and seam diagrams.

3 **6 Hours**

EXPERIMENT 3

Construction of Kameez and its varieties with suitable seam specification and seam diagrams.

4 **6 Hours**

EXPERIMENT 4

Construction of Ladies blouse with suitable seam specification and seam diagrams.

5 **6 Hours**

EXPERIMENT 5

Preparation of Tech pack for Top wear for Men & women and kids wear.

6 **6 Hours**

EXPERIMENT 6

Construction of casual trouser with suitable seam specification and seam diagrams.

7 **6 Hours**

EXPERIMENT 7

Construction of knickers with suitable seam specification and seam diagrams.

8 **6 Hours**

EXPERIMENT 8

Construction of salwar with suitable seam specification and seam diagrams.

9 **6 Hours**

EXPERIMENT 9

Construction of kameez with suitable seam specification and seam diagrams.

10 **6 Hours**

EXPERIMENT 10

Preparation of Tech pack for Bottom wear for Men & women and kids wear.

Total: 60 Hours

Reference(s)

1. B. Claire and Shaeffer, Sewing for Apparel Industry, Pearson's Prentice Hall, New Jersey, 2000.
2. B. Claire Shaeffer& Glee Barre, High Fashion Sewing Secrets from the World's Best Designers: A Step- By- Step Guide to Sewing Stylish Seams, Buttonholes, Pockets, Collars, Hems, And More, Rodale Books Publisher, New York, 2001.
3. Marry Mathew, Practical Clothing Construction Part I, Basic Sewing Process, Cosmic Press, Chennai,1999.

18HS002 PROFESSIONAL ETHICS IN ENGINEERING **2 0 0 2**

Course Objectives

- To understand Human Values and ethical theory.
- To understand codes of ethics, work place responsibilities, rights, engineeringexperimentation, global issues and contemporary ethical issues.
- To understand personal ethics, legal ethics, cultural ethics and engineers responsibility.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

g. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

o. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcomes (COs)

1. Assess engineering ethics theory with sustained lifelong learning.
2. Determine a good character and follow high professional ethical life.
3. Support to shape a better character by following ethical actions.
4. Evaluate and resolve moral issues occurred during technological activities.
5. Resolve moral and ethical problems through exploration and assessment by established experiments.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2			1			2		1					
2	2			1			3		1					
3	2			1					3					
4	2			1										
5	2			1										

UNIT I **6 Hours**

HUMAN VALUES

Morals and Ethics - Honesty - Integrity - Values - Work Ethic - Civic Virtue - Respect for Others - Living Peacefully - Caring and Sharing - Self-Confidence - Courage - Co-operation - Commitment – Empathy

UNIT II **6 Hours**

ENGINEERING ETHICS AND PROFESSIONALISM

Scope of Engineering Ethics- Variety of moral issues - Types of inquiry - Accepting and sharing responsibility - Ethical dilemmas - Moral autonomy - Kohlbergs and Gilligan's theory - Consensus and controversy - Profession and Professionalism - Models of Professional Roles - Right action theories - Senses of corporate responsibility - Codes of ethics: Importance 1stification -limitation – Abuse

UNITIII **6 Hours**

ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as experimentation - Engineers as responsible experimenters - Balanced outlook on law - Cautious optimism - Safety and risk - Assessing and reducing risk - Safe exits - The Challenger case study - Bhopal Gas Tragedy - The Three Mile Island and Chernobyl.

UNIT IV **6 Hours**

WORKPLACE RESPONSIBILITIES AND RIGHTS

Fundamental Rights - Responsibilities and Duties of Indian Citizens - Teamwork - Ethical corporate climate - Collegiality and loyalty - Managing conflict - Respect for authority - Collective bargaining - Confidentiality - Conflicts of interest - Occupational crime - Professional rights - Employee rights.

UNIT V **6 Hours**

GLOBAL ISSUES

Multinational corporations: Technology transfer and appropriate technology - International rights - promoting morally just measures - Environmental ethics: Engineering, ecology - economics - Human and sentient centred - and bio and eco centric ethics - Computer ethics and internet - Engineers as managers - Consulting engineers - Engineers as expert witnesses and advisors - Moral leadership.

FOR FURTHER READING

Sample code of ethics like IETE, ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management.

Total : 30 Hours

Reference(s)

1. Mike W Martin and Roland Schinzinger, Ethics in Engineering, 4th edition, Tata McGraw Hill Publishing Company Pvt Ltd, New Delhi, 2014.
2. M Govindarajan, S Natarajan and V S Senthil Kumar, Engineering Ethics, PHI Learning Private Ltd, New Delhi, 2012.
3. R S Naagarazan, A text book on professional ethics and human values, New age international (P)limited, New Delhi, 2006.
4. Charles D Fleddermann, Engineering Ethics, Pearson Education/ Prentice Hall of India, New Jersey,2004.
5. Charles E Harris, Michael S Protchard and Michael J Rabins, Engineering Ethics - Concepts and Cases, Wadsworth Thompson Learning, United States, 2005.
6. http://www.slideworld.org/slidestag.aspx/human-values-and- Professional-ethics

18FT602 INDUSTRIAL ENGINEERING **3024**

Course Objectives

- To understand the Industrial Engineering concepts and their uses.
- To utilize the various Industrial Engineering techniques in apparel manufacturing process.
- To understand the Material movement in the apparel manufacturing process.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering

specialization to the solution of complex engineering problems.

b. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

f. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

m. Apply the knowledge of elements of design and Gestalt theory of visual perception to understanding, articulation, design development and production of Fashion design, Accessories, Artworks and other Design compositions.

Course Outcomes (COs)

1. Apply the industrial Engineering concepts and determine the factors affecting productivity.
2. Assess the productivity in the apparel industry and plan productivity management strategies.
3. Evaluate the material management functions and execute planning techniques in calculating the material requirements.
4. Analyze the concepts of time and motion study and execute work study procedures for calculating SAM values.
5. Analyze Value Management Techniques and design strategies for value management

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
2	2	3	2		1	2								
2	2	3	2		1	2								
2	2	2	2		1									
2	2	3	2		1	2								
5	2				1									

UNIT I **9 Hours**

INTRODUCTION TO INDUSTRIAL ENGINEERING

Industrial Engineering - concepts, functions, applications and role of industrial engineer; Tailoring vs Garmenting, Fundamentals of industrial engineering - operations analysis and design, operations control and management; productivity concept and importance, factors affecting productivity, kinds of productivity measures. Cycle time, basic time, SAM and SMV calculation.

UNIT II **9 Hours**

CONCEPTS OF PRODUCTIVITY

Productivity Definition-Importance-Productivity-Managements Role and Responsibility-The Key Elements Of Productivity-Productivity Measurement-Productivity Analysis-Productivity Improvement; Total Productivity Management - Introduction- Adoption of Total Productivity Management And Techniques For Total Productivity Expansion- Procedures For Adopting And Advancing The Use of Total Productivity Management. Benefits of increased productivity.

UNIT III **9 Hours**

PRODUCTION PLANNING AND INVENTORY CONTROL

Materials management - meaning, functions and objectives; Production, planning and control. Pre-production activities of a supervisor. Inventory control: purpose, types, functions, EOQ, ABC, VED and FMEA analysis. Introduction to MRP, JIT, Kanban, SMED.

UNIT IV **9 Hours**

WORK STUDY

Definition and concepts of work study (time and motion study); objectives of method study and work measurement for the apparel industry; method study procedure; flow process charts for the various processes in the apparel industry; flow diagram, string diagram, multiple activity chart, SIMO chart and Travel chart. Time study procedures, standard data required for time study, Calculation of SAM.

UNIT V **9 Hours**

VALUE MANAGEMENT

Introduction - Value Management and Industrial Engineering- Value Management Process - Key Value Management Techniques - Information Phase Techniques -Function Analysis Techniques- Evaluation Techniques- Value Management - Focus - Communications - Multidisciplinary Team Approach - Function Analysis / FAST Diagram.

FOR FURTHER READING

Toyota Production System (TPS), Lean Manufacturing, World Class Manufacturing, Increasing the productivity of resources - Building design and storage space requirement for the apparel industry - Financial planning and control- Ergonomics in apparel industry - Sales forecasting and techniques.

1 **3 Hours**

EXPERIMENT 1

Calculate standard allowed minute for the particular style (Men's T shirt & Women's Skirt)

2 **3 Hours**

EXPERIMENT 2

Study the work measurement of level of garment industry for automatic welt pocket attaching machine (Activity sampling & Time study form)

3 **3 Hours**

EXPERIMENT 3

Analyze optimized techniques for manufacturing apparel products through Methods study (Outline process chart & Flow process chart) for a particular style.

4 **3 Hours**

EXPERIMENT 4

Analyze optimized line sequence for manufacturing apparel products through Methods study (Flow diagram & String diagram) for the particular style.

5 **3 Hours**

EXPERIMENT 5

Analyze optimized line sequence for manufacturing apparel products through Methods study (Various Charts) for collar turning and sleeve preparation process.

6 **3 Hours**

EXPERIMENT 6

Analyze the Factory simulation game of apparel production unit with all the necessary items.

7 **3 Hours**

EXPERIMENT 7

Create plant layout for given lot production

8 **3 Hours**

EXPERIMENT 8

Analyze the Operation break down for the particular style (Men's formal shirt)

9 **3 Hours**

EXPERIMENT 9

Analyze the performance of the operator for the particular style by using on standard efficiency technique

10 **3 Hours**

EXPERIMENT 10

Analyze the performance of the operator for the particular style by using on standard efficiency technique.

Total: 75 Hours

Reference(s)

1. V.Ramesh babu, Industrial Engineering in Apparel Production, Woodhead publishing india,ISBN 9780857091079,November 2011
2. Kjell B. Zandin and Harold B. Maynard, Maynard's Industrial Engineering Handbook, McGraw-Hill Professional, 2001.
Jacob Solinger, Apparel Manufacturing Handbook, Bobbin Blenhei Media Corporation, Nashville, USA, 1988.
3. W. G. Ireson and E. L. Grant, Handbook of Industrial Engineering and Management, Prentice Hall of Robi, New Delhi, 1988.
4. Johnson Maurice, Introduction to Work Study, International Labour Organization, Geneva, 1995.
5. O. P. Khanna, Industrial Engineering & Management, Dhanpat Rai & Sons, Delhi, 1987.
6. https://www.onlineclothingstudy.com.

18FT603 FASHION PORTFOLIO 2 0 2 3

Course Objectives

- To equip the students to curate and express inspiration and mood board ideas.
- To apply sketching skills and design exploration techniques.
- To impart knowledge of organizing different elements in a portfolio and bringing out the desired look.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

i. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Apply trend analysis with its key concepts: color, style, fabric and prepare trend reports for the chosen apparel category.
2. Create the appropriate inspiration sources benefitting the target customer.
3. Create design exploration sketches, fashion illustrations and determine fabric specifications.
4. Evaluate intended design outcomes by manipulating fabrics.
5. Produce garments and bring out the look desired through photoshoot with a proper presentation.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2			3				2	2			3	2
2	2	2			3				2	2			3	2
3	2	2			3				2	2			3	2
4	2	2			3				2	2			3	2
5	2	2			3				2	2			3	2

UNIT I **6 Hours**

TREND ANALYSIS

Trend analysis: Introduction to online trend forecasting platforms, Segmentation of consumes, performing online visual research, interpreting trends, generation of forecast report.

UNIT II **6 Hours**

FASHION DESIGN COMPONENTS

Inspiration board: elements to be present, visual arrangements. Mood board: Deriving mood board elements from the trend forecast report**,** Color board: color story, base color, ascent and descent colors and color proportions.

UNIT III **6 Hours**

DESIGN DEVELOPMENT

Design exploration techniques, fashion illustration: poses, rendering different fabrics, flat sketch: seam details, fabric and trim details, accessory board. Fabric selection parameters; flowy fabrics, sheer fabrics, suiting fabrics, shirting fabrics, heavy fabrics, denims, self-designed fabrics. Fabric end use parameters.

UNIT IV **6 Hours**

FABRIC MANIPULATION

Fabric manipulation techniques: surface embellishments, different dyeing techniques: batik, tie and dye, vegetable dyeing, marbling. Other ornamentation techniques.

UNIT V **6 Hours**

PROTOTYPE DEVELOPMENT

Garment construction: selection of appropriate needles, seams, stitches. fit testing. Fashion photo shoot: product and model photo hoot. Developing theme; Choosing poses, Hair and makeup, accessories, background selection. Arranging elements in the portfolio.

SELF STUDY

Design development folder preparation - Inspiration, Illustration board, Fabric board, Client board, Mood board. Real Pattern preparation and sample preparation for one look.

1 **3 Hours**

EXPERIMENT 1

Develop a trend analysis report for the chosen apparel category and target customer.

2 **3 Hours**

EXPERIMENT 2

Develop an inspiration board appropriate for the season, category and target customer's AIO.

3 **3 Hours**

EXPERIMENT 3

Develop a Mood board and color story elaborating the theme chosen.

4 **3 Hours**

EXPERIMENT 4

Develop 25 design exploration for garments from the elements taken from the mood board.

5 **3 Hours**

EXPERIMENT 5

Develop 10 fabric manipulated swatches (Draping, dyeing, surface embellishments, print artworks) for the mood board chosen and develop a Fabric manipulation board.

6 **3 Hours**

EXPERIMENT 6

Develop full length illustrations for the final designs and render them appropriately, also develop flat sketches. Develop trims and accessories board.

7 **3 Hours**

EXPERIMENT 7

Construct 3 garments finalized from the design explorations with measurements of your model.

8 **3 Hours**

EXPERIMENT 8

Construct 3 garments finalized from the design explorations with measurements of your model.

9 **3 Hours**

EXPERIMENT 9

Develop a photoshoot expressing the moods of the garments made with appropriate styling.

10 **3 Hours**

EXPERIMENT 10

Arrange all the boards and picture and present them in a proper portfolio format, conclude the developed designs by correlating it with the mood and inspiration.

Total: 60 Hours

References

1. Designing Your Fashion Portfolio From Concept to Presentation 1st edition, Joanne Barrett, Publication 2014.
2. Portfolio Presentation for Fashion Designers, Linda Tain 4th edition. Publication 2018
3. Anette Fischer and Kiran Gobin, Construction for fashion design, Bloomsbury, 2017.
4. Karl Aspelund, The design process, Fairchild, 2015.
5. Www.29andseptemberstudio.com

18FT604 FASHION RETAIL MANAGEMENT 3 0 0 3

Course Objectives

- To understand the Retail management concepts and their uses
- To utilize the strategical knowledge obtained in developing a retail store
- To plan the merchandise assortments and cater to the needs of customers

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

d. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations

g. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

h. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

k. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Course Outcomes (COs)

1. Analyze the retail management system in terms of its characteristics and functions
2. Analyze the retailing strategies and devise an organization structure
3. Differentiate the types of retailers, attribute its locations and functions
4. Determine the factors influencing sale and manage information systems
5. Plan the merchandise assortments and the inventory management of a retail store.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3												
2		3						2						
3	1	2		3										
4				3				2			1			
5	1	3									2			

UNIT I **9 Hours**

INTRODUCTION TO RETAIL

Introduction to retail management – characteristics and significance, Types of retailing – single channel and multi-channel, Relationship between retailers and suppliers, changing trends in retailing – Retail structure and consumer interaction, emerging forms of retailing.

UNITII **9 Hours**

RETAIL ORGANIZATION AND ITS STRUCTURE

Retail strategy – building and sustaining relationships, Elements in retail mix – location, merchandise assortment, store display and design, pricing, customer service and communication mix. Retail image and promotional strategy, Retail communication mix, Organizational structure and human resource management.

UNIT III **9 Hours**

STORE FORMAT AND LOCATION

Retailer characteristics – Types of retailers – food, general merchandise, non-store, Forms of retailing – ownership based and store based strategy mix, non-store based, Operational dimensions, Trading area analysis – Geographic information system (GIS), Site selection - computerized trading area analysis models

UNIT IV **9 Hours**

MERCHANDISE MANAGEMENT

Merchandising philosophy – micro merchandising and cross merchandising, Devising merchandise plans – forecasts,assortment,timing and allocation, Reordering merchandise, Inventory management-

basic stock method, Planning purchases – Open-to-buy (OTB), Economic order quantity (EOQ).

UNIT V **9 Hours**

STORE PLANNING AND RETAIL INFORMATION SYSTEM

Store planning – utility of planograms, Merchandise planning - line plan and range plan. Retail information system (RIS) – significance, Universal Product code (UPC), Electronic data interchange (EDI), Information gathering and data base management.

FOR FURTHER READING

Store layouts, Planogram softwares, Retail methods of accounting.

Total: 45 Hours

Reference(s)

1. Retail Management – A strategic approach, Barry Berman, Joel R Evans, Tenth Edition, Pearson Education, Inc, 2007.
2. Fashion Retailing – A multi-channel approach, Ellen Diamond, Jay Diamond and Sheri Litt, Bloomsbury, 2006.
3. Y.P.Singh, Effective Retail Management,Anmol Publications Pvt.Ltd. NewDelhi,2001.
4. Elaine Stone, Fashion Merchandising, BlackwellScience Ltd.,2000.
5. https://www.vm.com

18FT607 APPAREL CAD II **0 0 4 2**

Course Objectives

- To impart them knowledge in identifying the pattern making tools used in Lectra software and develop efficient patterns.
- To equip them in developing different garment patterns and grading the patterns in efficient manner.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Demonstrate the functions of tools of Diamino marker making module of Lectra software
2. Generate a marker plan for the pattern pieces included in the Variant with reference to given fabric.
3. Create 3D digital illustrations of design and on mannequins in Reach fashion studio.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	1			3					1				
2	2	1			3					1				
3	2	1			3					1				

1 **6 Hours**

EXPERIMENT 1

Draft a men's trouser pattern, develop three different leg fits from it, seam the patterns and grade them in three inseam lengths. Develop a marker plan on a fabric width of 135cm.

2 **6 Hours**

EXPERIMENT 2

Draft a men's casual shirt pattern and develop a marker plan on a plaid fabric having 2X2 cm size pattern. The patterns should be matched at sleeve setting, pocket attachment, yoke and placket. Consider the fabric width as 140cm.

3 **6 Hours**

EXPERIMENT 3

Draft a full skirt. Assume an engineered stripe line passes through the princess seam line on the both sides of center front. The fabric width is 120cm with the engineered stripe located at 45cm from the selvedge. Develop an appropriate marker.

4 **6 Hours**

EXPERIMENT 4

Draft a Shawl collar jacket pattern in misses size 8 and prepare a marker plan in 120cm plain weave poplin fabric and 120cm herring bone twill fabric.

5 **6 Hours**

EXPERIMENT 5

Draft a women's night suit and prepare marker plan in 140cm plaided fabric.

6 **6 Hours**

EXPERIMENT 6

Develop a 3D visual display of Women's business suit with coordinating accessories. Suggest a suitable fabric structure and show its simulation.

7 **6 Hours**

EXPERIMENT 7

Develop a 3D visual display of conceptual Figure skating suit for men and women both. Coordinate it with right accessories.

8 **6 Hours**

EXPERIMENT 8

Develop a 3D visual display of biker jackets and cargo shorts. Coordinate it with right accessories

9 **6 Hours**

EXPERIMENT 9

Develop a 3D visual display of any three Bohemian silhouettes with coordinating accessories.

10 **6 Hours**

EXPERIMENT 10

Develop a 3D visual display of women's gown for red carpet wear and Coordinate it with right accessories.

Total: 60 Hours

18FT608 GARMENT CONSTRUCTION III **0 0 4 2**

Course Objectives

- To demonstrate skills in sewing different types of seams.
- To demonstrate skills in constructing commercial garment categories
- To demonstrate skills in finishing garment samples

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Analyse seam specifications of commercial garment categories.
2. Evaluate silhouettes and construct the designer garment applying garmenting techniques.
3. Apply fundamental concepts and prepare technical specifications.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3				2					2			2	
2	3				2					2			2	
3	3				2					2			2	

1 **6 Hours**

EXPERIMENT 1

Design and construction of Women's airhostess jacket with shawl collar.

2 **6 Hours**

EXPERIMENT 2

Design and construction of Women's airhostess skirt style.

3 **6 Hours**

EXPERIMENT 3

Prepare a technical specification for women's airhostess ensemble with suitable seam specification and seam diagrams.

4 **6 Hours**

EXPERIMENT 4

Design and construction of men's athletic wear: trunk and shorts.

5 **6 Hours**

EXPERIMENT 5

Prepare a technical specification for men's athletic wear: trunk and shorts with suitable seam specification and seam diagrams.

6 **6 Hours**

EXPERIMENT 6

Design and construction of women's sheath dress.

7 **6 Hours**

EXPERIMENT 7

Prepare a technical specification for women's sheath dress with suitable seam specification and seam diagrams.

8 **6 Hours**

EXPERIMENT 8

Design and construction of long anarkali top.

9 **6 Hours**

EXPERIMENT 9

Prepare a technical specification for long anarkali top with suitable seam specification and seam diagrams.

10 **6 Hours**

EXPERIMENT 10

Preparation of Tech pack for Men's formal shirt & women's formal shirt. Determine the differences between them.

Total: 60 Hours

Reference(s)

1. B. Claire and Shaeffer, Sewing for Apparel Industry, Pearson's Prentice Hall, New Jersey, 2000.
2. B. Claire Shaeffer& Glee Barre, High Fashion Sewing Secrets from the World's Best Designers: A Step- By-Step Guide to Sewing Stylish Seams, Buttonholes, Pockets, Collars, Hems, And More, Rodale Books Publisher, New York, 2001.
3. Marry Mathew, Practical Clothing Construction Part I, Basic Sewing Process, Cosmic Press, Chennai,1999.

18GE601 SOFT SKILLS-APTITUDE II 0 0 2 0

Course Objectives

- Expose the undergraduate students to such methods and practices that help, develop and nurture qualities such as character, effective communication, aptitude and holding ethical values. It will provide a lot of activities and examples for a student to learn and developthese life skills.

Course Outcomes (COs)

1. Apply the concepts of probability, Sets, Permutation and Combinations in estimating data for real time problems.
2. Apply the concept of logarithms, progressions and Simple and Compound interest tosolve various practical problems.
3. Analyse objects involving cubes and cuboids in determining the number of sides colored.
4. Analyse various data from graphs and tables to determine ratio, percentage and averages.
5. Apply the logical reasoning skills for identifying age, relations, visual relations and puzzles.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2									1				
2	2									2				1
3	2		3			2				1				1
4														
5						4								

1 **1Hour**

PERMUTATION AND COMBINATION

Definition-Fundamental rules-Theorems on Permutation-Theorems on Combination.

2 **1 Hour**

PROBABILITY

Concept and Importance of Probability-Underlying factors for real Life estimation of probability-Basic facts about probability-Some important consideration while defining event.

3 **1 Hour**

SYLLOGISM AND VENN DIAGRAM

Concepts on Syllogisms-Venn diagram-Interpretation-Venn diagram-solving.

4 **1 Hour**

SIMPLE INTEREST AND COMPOUND INTEREST

Introduction-Definition - Effect of change of P, R, T on simple interest-Amount-Amount becomes N times the principle-Repayment of debt in equal installments-Rate and time are numerically equal-Compound Interest-Conversion period-Basic formula-Special cases-To find the principle / Time /Rate-Difference between Compound Interest and Simple Interest-Equal annual installment to pay the borrowed amount.

5 **1 Hour**

MIXTURES AND ALLIGATION

Definition-Alligation rule-Mean value (cost price) of the mixture-Some typical situations where allegation can be used.

6 **1 Hour**

CUBE AND LOGARITHM

Introduction-Basic Concepts of Cube and Cuboid-Problems involving cubes and cuboids of various dimensions-Problems involving colored cubes and cuboids - Basic concepts of Logarithm-Laws of Logarithms including change of base-Common logarithm (base 10) - Properties of Logarithms to solve equations involving logarithmic expressions.

7 **2 Hours**

DATA INTERPRETATION

Introduction-Ratio-Percentage-Average-Tables – Graphs and Charts.

8 **1 Hour**

PROGRESSION AND LOGICAL REASONING

Arithmetic progression-Geometric progression-Harmonic progression-Theorems related with progressions.

9 **2 Hours**

PROBLEM ON AGES

Introduction-Basic concept-Usage of Percentage and Averages –Applications.

10 **2 Hours**

ANALYTICAL REASONING

Introduction-Basic concept-Nonv erbal Analytical Reasoning –Arrangements.

11 **2 Hours**

BLOOD RELATION

Introduction-Basic concept-Kinds of relation-Tree diagram –Relations.

12 **1 Hour**

VISUAL REASONING

Introduction-Basic concepts-Odd man out-Next series-Mirror image and water image

13 **2 Hours**

SIMPLIFICATIONS

Introduction-Basic concepts-Arithmetic operations-Equation solving methods-Puzzles.

Total : 15 Hours

Reference(s)

1. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, Fourth Edition, Mc Graw Hill Publications.

2. U. Mohan Rao, Quantitative Aptitude for Competitive Examinations, Scitech Publications Pvt Ltd, India.
3. Dinesh Khattar, The Pearson Guide to Quantitative Aptitude for Competitive Examinations, Third Edition, Pearson Education Pvt Ltd, India, 2016.
4. Dr. R S Aggarwal, A Modern Approach to Verbal and Non Verbal Reasoning, Revised Edition, S Chand Publications.
5. Arun Sharma, How to prepare for Logical Reasoning for CAT & other Management Exams, Fifth Edition, Mc Graw Hill Publications.
6. Jaikishan and Premkishan, How to Crack Test of Reasoning in all Competitive Examinations, Revised Edition, Arihant Publications.

18HS003 PRINCIPLES OF MANAGEMENT 2 0 0 2

Course Objectives

- To develop cognizance about importance of management principles.
- Extract the functions and responsibilities of managers.
- To Study and understand the various HR related activities.
- Learn the application of the theories in an organization.
- Analyze the position of self and company goals towards business.

Course Outcomes (COs)

1. Analyze basic concepts of Management.
2. Assess knowledge on planning process and its Tools & Techniques.
3. Analyse the concept of organizing and staffing.
4. Analyse the management concept of directing.
5. Analyse the management concept of controlling.

UNIT I **9 Hours**

INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS

Definition of Management - Science or Art. Manager Vs Entrepreneur-types of managers- Managerial roles and skills, Evolution of Management, Scientific, Human Relations, System and Contingency approaches. Types of Business organization- Sole proprietorship, partnership, Company-public and private sector enterprises-Organization culture and Environment. Current Trends and issues in Management.

UNIT II **9 Hours**

PLANNING

Nature and purpose of planning-Planning process-Types of planning-Objectives-Setting objectives-Policies- Planning premises - Strategic Management- Planning Tools and Techniques-Decision making steps and process.

UNIT III **9 Hours**

ORGANISING

Nature and purpose. Formal and informal organization. Organization chart. Organization Structure. Types - Line and staff authority, Departmentalization, delegation of authority, Centralization and decentralization, Job Design-Human Resource Management, HR Planning, Recruitment, selection, Training and Development, Performance Management, Career planning and management.

UNIT IV **9 Hours**

DIRECTING

Foundations of individual and group behavior-Motivation-Motivation theories- Motivational techniques-Job satisfaction-Job enrichment-Leadership-types and t h e o r i e s of leadership-Communication-Process of communication-Barrier in communication-Effective communication-Communication and IT.

UNIT V **9 Hours**

CONTROLLING

System and process of controlling-Budgetary and non-Budgetary control techniques-Use of Computers and IT in Management control-Productivity problems and management-Control and Performance-Direct and preventive control-Reporting.

Total : 45 Hours

Reference(s)

1. 1. Robbins, S. (2017). Management, (13th ed.), Pearson Education, New Delhi.
2. Stephen A. Robbins and David A. Decenzo and Mary Coulter, Fundamentals of Management, Pearson Education,7th Edition, 2011.
3. Robert Kreitner and Mamata Mohapatra, Management, Biztantra, 2008.
4. L. M. Prasad, Principles and Practice of Management. 7th Edition, Sultan Chand & Sons, 2007.
5. P. C. Tripathi and P. N. Reddy, Principles of Management, Fourth Edition, Tata McGraw Hill, 2008

18FT702 APPAREL SOURCING AND COSTING **3 0 0 3**

Course Objectives

- To know the sourcing strategies concept
- To impart knowledge on various costing techniques

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design solutions for complex engineering problems and design system components or processes
that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
j. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyze sourcing strategies concepts and determine the sourcing methods.
2. Evaluate and apply the sourcing design formats in processing orders
3. Differentiate budgeting concepts and different elements of costing.
4. Generate manufacturing and material cost estimates of Apparel styles
5. Analyze the demand and supply chain concepts and formulate pricing strategies.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3	1							2				2
2	2	3	1							2				2
3	2	3	1							2				2
4	2	3	1							2				2
5	2	3	1							2				2

UNIT I **9 Hours**

SOURCING STRATEGIES

Principles of sourcing strategy -out sourcing. Sourcing goals and objectives. Source selection - contracts and incentives, supplier strategies. Sourcing data and reports.

UNIT II **9 Hours**

SOURCING DESIGN

Sourcing design elements. Risks and rewards of multiple sourcing. Capacity constraints and pricing in sourcing markets. LIC selection and incentives for innovation -Yard stick contracts. Case studies in sourcing.

UNITIII **9 Hours**

BUDGETING AND PRINCIPLES OF COSTING

Budgeting - aims of Budgeting, types of budget. Costing - aims of costing, Elements of cost - Material cost, Labour cost and overheads, difference between budgeting and costing. Depreciation cost - reasons and methods of calculating depreciation.

UNIT IV **9 Hours**

COST FACTORS AND PRACTICES

Costing of garments: cost determinants - cost of yarn - fabric production - processing, lot size and design affecting cost, cutting, making and trim cost. Cost of bought out components - Thread, Button, Zipper, Interlining. Costing methods, Cost estimation bulk production. Cost calculation by interpreting Specification sheet Practical cost calculation for Ladies, Mens and Children's wear - woven and knitted.

UNIT V **9 Hours**

PRICING OF APPAREL PRODUCTS

Determining Pricing of apparel products: Price elasticity of demand and supply, sample costing- marginal revenue and marginal cost, cost plus pricing methods; Full cost pricing, conversion cost

pricing differential cost pricing ,variable cost pricing, direct cost pricing derivation of cost of apparel products-woven/knits; The budgeting process: Budgeting principles for the apparel industry, fixed vs. variable budget ,master budget, laminations of budgets' any justification effort.

FOR FURTHER READING

The act of purchasing, the work that is performed in a procurement department, how to differentiate different supplier categories with strategic sourcing, and how to elevate a firm's performance with strategic sourcing. Best practices in sourcing and procure-to-pay systems which enable firms to automate and accelerate essential sourcing functions.

Total : 45 Hours

Reference(s)

1. Sudhi Sheshadri ―Sourcing Strategy‖, Principles, Policy and Design , Springer, 2005.
2. Charles T. Horngren, Introduction to Management Accounting, Prentice Hall, New Delhi, 2001.
3. M. I. Mahajan, Export Policy, Procedures and Documentation, Snow-white Publishers, Mumbai, 2007.
4. R. Narayanaswamy, Financial Accounting - A Managerial Perspective, Prentice Hall India Pvt. Ltd.,New Delhi,1997.
5. S. K. Bhattacharya & John Dearden, Accounting for Management Text and Cases, Vikas Publishing House, New Delhi, 2000.
6. https://www.onlineclothingstudy.com

18FT703 APPAREL PRODUCTION MANAGEMENT 3 0 2 4

Course Objectives

- To understand the concepts in production planning and control.
- To apply the various techniques in production planning and control.
- To understand the material management and their movement in the production.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
e. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
f. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

Course Outcomes (COs)

1. Apply the concepts of production planning in lead time calculation.
2. Determine the process plan for garment manufacturing.

3. Analyse the production planning systems and organize production schedule for cutting.
4. Execute capacity planning and organize sewing production schedules.
5. Analyse the quality control measures of product development.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3	2		2	2								
2	2	3	2		2	2								
3	2	2	2		2	2								
4	2	3	2		2	2								
5	2				2	2								

UNIT I **9 Hours**

INTRODUCTION TO PRODUCTION PLANNING

Introduction: control parameters, apparel production parameters, planning and lead-time. Product development: Steps from prototype to production model, Importance of pre-production activities; Introduction to timetable concepts. Product data management: Understanding and interpretation of specification sheet.

UNIT II **9 Hours**

PROCESS PLAN

Operation sequence development: Garment breakdown with machine and attachment details, development of production grid for garment construction, development of production flowchart. Bundle tickets: Guidelines for bundle ticket design, functions of bundle tickets, bundle ticket control.

UNIT III **9 Hours**

OPTIMIZING PRODUCTION PLANS

Different manufacturing systems: Make through and Assembly line manufacturing - advantages and disadvantages. Lay lot planning: Numerical exercises on lay lot planning to optimize cutting cost, bundling, ticketing and cutting room control formats.

UNIT IV **9 Hours**

CAPACITY PLANNING

Production Planning And Control: Capacity calculation for cutting, sewing and finishing. Determination of machine requirements for new factory. Line balancing: Determination and allocation of manpower and, machine for balanced production in existing plant for a given target.

UNIT V **9 Hours**

QUALITY IN PRODUCT DEVELOPMENT

Quality In Product Development: Quality assurance during product development - methods to avoid problems during pattern making, garment construction and other areas. Inspection procedures. Work-study in garment industry - methods to control time and cost.

FOR FURTHER READING

Toyota Production System (TPS), Lean Manufacturing, World Class Manufacturing, Increasing the

productivity of resources - Building design and storage space requirement for the apparel industry - Financial planning and control- Ergonomics in apparel industry - Sales forecasting and techniques.

1 **3 Hours**

EXPERIMENT 1

A production line of Vinka Fashion Limited works with 45 operators for 10 hours a day and produces 1400pcs dress shirts. The shirt has a standard time of 1000 seconds. Calculate productivity of the line.

2 **3 Hours**

EXPERIMENT 2

A production line of Trina Fashion wear limited produces 250 dozens shelf camies by 30 operators in 10 hours. Standard time of shelf camies is 250 seconds. Calculate productivity for that production line.

3 **3 Hours**

EXPERIMENT 3

Nika fashion wear limited has produced the below goods in a week of 60 hours. Statistics are given in the following table. Calculate the productivity.

SL No.	Item	Standard time	Quantity	No. of operator
01	T-Shirt	250sec	1800dz	30
02	Dress Shirt	1000sec	7200pcs	45
03	Shelf Cammy	250sec	1800dz	30

4 **3 Hours**

EXPERIMENT 4

For a polo shirt garment,

- Standard allowed minutes (SAM) is-25 minutes,
- Number of operators in a working line is-20
- Number of hours running-production line work in a day- 8hrs
- Average line efficiency – 60%
- Total break time including Launch, Tea and Others- 60 minutes
- Calculate the estimated polo shirt garments production.

5 **3 Hours**

EXPERIMENT 5

SAM of a particular garment is 25 min, with 25 operators line, which works 8hr shift in a day. Line works at an average efficiency of 70%. Operators are given a total 30 min for break. Now calculate the monthly production of the factory.

6 **3 Hours**

EXPERIMENT 6

Consider that a company has received an order with target date as 20 days from today the order quantity is 25,000, total garment SMV is 6.74. Consider the following data as input, factory line efficiency – 65%, each line works with 15 operators. Calculate number of lines required to complete the order within the target date.

7 **3 Hours**

EXPERIMENT 7

A factory producing girls top at the standard minute value of 5.75 with the order quantity of 85,000 pieces. The average production of the factory is, 800 garment / 8 hour shift with 10 operators in individual line. There is only one line left free during this period.

Hence, calculate the number of operators required to complete the order in 38 days using single line.

8 **3 Hours**

EXPERIMENT 8

Calculate the cutting cost and rate per apparel from the following chart.

SL No.	Parameters	Quantity and Cost
01	Order quantity	10000pcs
02	Number of cutting master	5
03	Wage of cutting master	Rs. 200 per shift
04	Production per shift	2000 apparel
05	1 day	2 shifts (1 shift= 8hrs)
06	1 bundle	100pcs
07	1 bundle	1 tag
08	1 apparel	5 parts
09	1 part	1 sticker (1 bundle= 1 part)
10	Tag price	Rs. 0.50
11	Sticker price	Rs. 10 per 100 stickers
12	1 day	2 shifts
13	Power	Rs. 5000 per month
14	Salary	Rs. 50000 per month
15	Rent	Rs. 10000 per month
16	Other expenses	Rs. 15000 per month
17	Profit	15%

9 **3 Hours**

EXPERIMENT 9

Find the productivity with the following details: 105 machines, 100 operators, 20 helpers, 10 checkers, and 3 supervisors. The duration of a shift is 450 minutes. Product is Shirts with a SAM of 16.59 min.

10 **3 Hours**

EXPERIMENT 10

KNT Garments Company has 20 operators who work 8 hours a day. The plant has 90% efficiency level.Working shift is 8 hours a day in which 1 hour is mainly for lunch and tea time break. Find the potential capacity.

Total: 75 Hours

Reference(s)

1. A.J. Chuter., " Introduction to Clothing Production Management ", Blackwell Scientific Publications

2. David J. Tyler., " Materials Management in Clothing Production ", Blackwell Scientific Publications Professional Books.
3. Jacob Solinger, Apparel Manufacturing Handbook, Bobbin Blenheim Media Corporation, Nashville, USA, 1988.
4. W. G. Ireson and E. L. Grant, Handbook of Industrial Engineering and Management, Prentice Hall of Robi, New Delhi, 1988.
5. Johnson Maurice, Introduction to Work Study, International Labour Organization, Geneva, 1995.
6. O. P. Khanna, Industrial Engineering & Management, Dhanpat Rai & Sons, Delhi, 1987.
7. https://www.onlineclothingstudy.com

18FT704 GARMENT TESTING - PERFORMANCE AND SUSTAINABILITY

3 0 0 3

Course Objectives

- To have fundamental knowledge on garment testing protocol and management of restricted substances.
- To acquire knowledge of the methodology of garment testing in the apparel industry.
- To apply testing of harmful substances as par international regulations to achieve sustainability in the apparel industry.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

d. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Analyse the fundamentals of garment testing and test data management.
2. Evaluate the specifications of quality standards and resolve the testing requirements of different protocols.
3. Apply the testing procedures of fabric and garment for determining care instruction of a garment.
4. Determine limits for restricted substances for achieving sustainability in garment quality.
5. Analyse the regulatory requirements of harmful substances in different countries for different garments.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3		-	3	2	3	3	1	1				
2	3	3	-	-	3	2	3	3	2	1				
3	3	3	-	-	3	2	2	3	2	1				
4	3	3	-	-	3	2	3	3	2	1				
5	2	1	-		1	2	3	3	3	3				

UNIT I **9 Hours**

ESSENTIAL ELEMENTS OF GARMENT TESTING

Garment testing and its importance, Routine testing, Random testing and Supplier initiated testing, Test data management and analysis, Role of regulatory and special tests, Management of restricted substances for RSL compliance.

UNIT II **9 Hours**

COMMON PROTOCOLS FOR GARMENT TESTING

Label verification, Identification, Washability, Performance, Colour fastness tests for woven, knitted, leather/suede and apparel related accessories such as belts, caps, ear muffs, gloves, hats, neckties, scarves and headbands, Special tests for technical outerwear, rainwear, intimate and sleepwear, sweaters, swimwear, down fill product and wrinkle resistance garment.

UNIT III **9 Hours**

GARMENT TESTING FOR DETERMINING GARMENT CARE

Washing tests: Machine wash at different temperature, Normal cycle, Permanent press and Delicate cycle, Hand wash, Bleaching tests: Chlorine bleach and Non-chlorine bleach, Drying tests: Drip dry, Flat dry, Line dry and Tumble dry, Ironing tests: Cool, Warm and Hot, Dry-cleaning: Petroleum, Fluorocarbon and Perchloroethylene, Professional dry-cleaning.

UNIT IV **9 Hours**

GARMENT TESTING FOR SUSTAINABILITY

Definition, Sustainable development and its goals, three dimensions of sustainability, Restricted Substances List (RSL), Testing of restricted substances such as carcinogenic and allergenic dyes, azo dyes, formaldehyde, chlorinated and other phenols, Chlorinated organic carriers, chromium VI, lead, cadmium, nickel, APEOs, Organotin compounds, phthalates, PVC, SCCPs, PAH, fluorocarbons, residual pesticides in garments, trims and embellishments, Overview of Manufacturing Restricted Substances List (MRSL) and its scope.

UNIT V **9 Hours**

GLOBAL REGULATORY TESTING REQUIREMENTS ON HARMFUL SUBSTANCES IN TEXTILE AND APPAREL

US regulations: CPSA, CPSIA, FHSA, FIFRA, TSCA, Cal Prop 65, WCSPA, EPA, EU regulations: REACH, BPR, GOTS, OEKO TEX Standard, China regulation, Korea Certification, Japanese regulation, Regulations of Vietnam, Regulations of Taiwan, Regulations of India.

Total: 45 Hours

Reference(s)

1. Subrata Das, Product Safety and Restricted Substances in Apparel Ã¢?? 2nd edition, Woodhead Publishing, 2016,
2. Nimkartek Technical Services Private Limited, Guidebook of Chemical Management for Textile and Apparel Industry, 2015.
3. Janace E. Bubonia, Apparel Quality: A Guide to Evaluating Sewn Products, Bloomsbury Publishing, 2014.
4. Texan Laboratories Private Limited, Ecological Considerations, parameters, and testing, 2011.
5. Subrata Das, Quality Characterizations of apparel, Woodhead Publishing.2010.
6. Sara J Kadolph, Quality Assurance for Textiles and Apparel, Fairchild Publicatons Inc., Chicago, 2007.

18FT707 PRODUCT DEVELOPMENT 0 0 4 2

Course Objectives

- To train the students in calculating material consumption for the fashion product.
- To impart the knowledge of executing sourcing activities for the materials identified in the fashion product
- To equip them develop technical specification sheet for the fashion product

Programme Outcomes (POs)

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

d. d. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

g. g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Create a problem brief based on the needs of the industry.
2. Evaluate ideation and prototyping of possible solutions for the developed brief.
3. Produce products as a solution for the defined problems and present them visually.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1		-	-	-			-	-		-			-	
2		-	-	-			-	-		-			-	
3		-	-	-			-	-		-			-	

1 **6 Hours**

EXPERIMENT 1

Identify an area for a product development opportunity which can be a design problem, technical problem, industry related opportunity and define the same.

2 **6 Hours**

EXPERIMENT 2

Develop an empathy map from the inputs curated from the stake holders.

3 **6 Hours**

EXPERIMENT 3

Prepare a board with the recent possible solutions available in the market and other innovations.

4 **6 Hours**

EXPERIMENT 4

Develop atleast 25 possible ideas that would be the possible solution to the defined problem through different ideation techniques.

5 **6 Hours**

EXPERIMENT 5

Develop 6 prototypes of possible design solution selected from the 25 ideas and document the same..

6 **6 Hours**

EXPERIMENT 6

Develop a technical specification sheet for the final chosen design.

7 **6 Hours**

EXPERIMENT 7

Raise a BOM (Bill of materials) for the product to be developed and source the same.

8 **6 Hours**

EXPERIMENT 8

Develop the proposed product and record the steps (Phase I).

9 **6 Hours**

EXPERIMENT 9

Develop the proposed product and record the steps (Phase II).

10 **6 Hours**

EXPERIMENT 10

Develop a presentation board and a broacher highlighting your product and its features.

Total: 60 Hours

18FT708 PROJECT WORK I **0 0 6 3**

Course Objectives

- To develop knowledge to formulate a real world problem and project's goals.
- To identify the various tasks of the project to determine standard procedures.
- To identify and learn new tools, algorithms and techniques.
- To understand the various procedures for validation of the product and analysis the cost effectiveness.
- To understand the guideline to Prepare report for oral demonstrations.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
d. d. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
f. f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
g. g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
k. k. Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

l. l. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Formulate a real world problem, identify the requirement and develop the design solutions
2. Express the technical ideas, strategies and methodologies.
3. Utilize the new tools, algorithms, techniques that contribute to obtain the solution of the project.
4. Test and validate through conformance of the developed prototype and analysis the cost effectiveness.
5. Prepare report and present the oral demonstrations

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	-	-	-	-			-					-	-	
2			-			-					-			-
3			-		-						-			
4				-	-	-	-	-						-
5									-	-				

Total: 0 Hours

18FT804 PROJECT WORK II **0 0 18 9**

Course Objectives

- To develop knowledge to formulate a real world problem and project's goals.
- To identify the various tasks of the project to determine standard procedures.
- To identify and learn new tools, algorithms and techniques.
- To understand the various procedures for validation of the product and analysis the cost effectiveness.
- To understand the guideline to Prepare report for oral demonstrations.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
d. d. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods

including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
f. f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
g. g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
k. k. Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
l. l. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyse a real world problem, find the requirement and create the design solutions
2. Evaluate the technical ideas, strategies and methodologies.
3. Apply the new tools, algorithms, techniques that contribute to obtain the solution of the project.
4. Evaluate and validate through conformance of the developed prototype and analysis the cost effectiveness.
5. Generate report and present the oral demonstrations

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	-	-	-	-			-					-	-	
2			-			-					-			-
3			-		-						-			
4				-	-	-	-	-						-
5									-	-				

Total: 0 Hours

LANGUAGE ELECTIVES

18HSH01 HINDI 1 0 2 2

Course Objectives

- To help students acquire the basics of Hindi
- To teach them how to converse in Hindi on simple day-to-day situations
- To help students acquire the ability to understand a simple technical text in Hindi

Course Outcomes (COs)

1. Apply simple sentences and use vocabulary required for day-to-day conversation.
2. Distinguish the basic sounds of Hindi language.
3. Apply for Hindi examinations conducted by Dakshin Bharat Hindi Prachar Sabha.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1														
2														
3														

UNIT I **9 Hours**

Hindi Alphabet: Introduction - Vowels - Consonants - Plosives - Fricatives - Nasal sounds - Vowel Signs - Chandra Bindu & Visarg -Table of Alphabet -Vocabulary.

UNIT II **9 Hours**

Nouns: Genders (Masculine & Feminine Nouns long vowels and short vowels - -Masculine & Feminine - Reading Exercises.

UNIT III **9 Hours**

Pronouns and Tenses: Categories of Pronouns - Personal Pronouns - Second person (you & honorific) - Definite & Indefinite pronouns - Relative pronouns - Present tense - Past tense - Future tense - Assertive & Negative Sentences - Interrogative Sentences.

UNIT IV **9 Hours**

Classified Vocabulary: Parts of body - Relatives - Spices - Eatables - Fruit & Vegetables - Clothes - Directions - Seasons - Professions.

UNIT V **9 Hours**

Speaking: Model Sentences and Rhymes - Speaking practice for various occasions.

Total: 45 Hours

Reference(s)

1. Hindi Prachar Vahini-1 by Dakshin Bharat Hindi Prachar Sabha Chennai
2. B.R. Kishore, Self-Hindi Teacher for Non-Hindi Speaking People,Vee Kumar Publications(P)Ltd., New Delhi,2009
3. Videos, Stories, Rhymes and Songs

18HSG01 GERMAN **1 0 2 2**

Course Objectives

- To help students appear for the A1 level Examination
- To teach them how to converse fluently in German in day-to-day scenarios

Programme Outcomes (POs)

j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Differentiate individual sounds of German
2. Apply basic sounds and words while speaking
3. Analyse short passages on familiar topics
4. Apply basic sentence structures while writing
5. Apply basic grammar and appropriate vocabulary in completing language tasks

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1										2				
2										2				
3										2				
4										2				
5										2				

UNIT I **9 Hours**

Introduction to German language: Alphabet - Numbers - Greetings - Days and Seasons- Working with Dictionary.

UNIT II **9 Hours**

Nouns - articles - Speaking about one self - Listening to CD supplied with the books, paying special attention to pronunciation

UNIT III **9 Hours**

Regular & Irregular verbs - Personal pronouns - family - Introduction to types of sentences

UNIT IV **9 Hours**

Question words-Types of Questions - Nominative case- Verb Conjugation - country - nationalities

UNIT V **9 Hours**

Verbs - to be & to have - conjugation - Hobby's - Framing basic Questions and answers

Total: 45 Hours

Reference(s)

1. Kursbuch and Arbeitsbuch, NETZWERK A1 DEUTSCH ALS FREMDSPRACHE, Goyal Publishers & Distributers Pvt. Ltd., New Delhi, 2015
2. Langenscheidt Eurodictionary - German - English / English - German, Goyal Publishers & Distributers Pvt. Ltd., New Delhi, 2009
3. Grundkurs, DEUTSCH Lehrbuch Hueber Munichen, 2007.

18HSH01 HINDI 1 0 2 2

Course Objectives

- To help students acquire the basics of Hindi
- To teach them how to converse in Hindi on simple day-to-day situations
- To help students acquire the ability to understand a simple technical text in Hindi

Programme Outcomes (POs)
Course Outcomes (COs)

1. Analyse the simple sentences and use vocabulary required for day-to-day conversation.
2. Differentiate the basic sounds of Hindi language.
3. Apply for Hindi examinations conducted by Dakshin Bharat Hindi Prachar Sabha.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2
3	3	2		2									3	3

UNIT I **9 Hours**

UNIT 1

Hindi Alphabet: Introduction - Vowels - Consonants - Plosives - Fricatives - Nasal sounds - Vowel Signs - Chandra Bindu & Visarg -Table of Alphabet -Vocabulary.

UNIT II **9 Hours**

UNIT 2

Nouns: Genders (Masculine & Feminine Nouns long vowels and short vowels - -Masculine & Feminine - Reading Exercises.

UNIT III **9 Hours**

UNIT 3

Pronouns and Tenses: Categories of Pronouns - Personal Pronouns - Second person (you & honorific) - Definite & Indefinite pronouns - Relative pronouns - Present tense - Past tense - Future tense - Assertive & Negative Sentences - Interrogative Sentences.

UNIT IV **9 Hours**

UNIT 4

Classified Vocabulary: Parts of body - Relatives - Spices - Eatables - Fruit & Vegetables - Clothes - Directions - Seasons - Professions.

UNIT V **9 Hours**

UNIT 5

Speaking: Model Sentences and Rhymes - Speaking practice for various occasions.

Total: 45 Hours

Reference(s)

1. Hindi Prachar Vahini-1 by Dakshin Bharat Hindi Prachar Sabha Chennai
2. B.R. Kishore, Self-Hindi Teacher for Non-Hindi Speaking People,Vee Kumar Publications(P)Ltd., New Delhi,2009
3. Videos, Stories, Rhymes and Songs

18HSJ01 JAPANESE 1 0 2 2

Course Objectives

- To train students for N5 Level Examination
- To teach them use basic Japanese sentences in day-to-day conversation
- To make students familiar with the Japanese cultural facets and social etiquettes

Programme Outcomes (POs)

Course Outcomes (COs)

1. Analyse and write Japanese alphabet
2. Differentiate basic sounds of the Japanese language
3. Apply appropriate vocabulary needed for simple conversation in Japanese language
4. Apply appropriate grammar to write and speak in Japanese language
5. Analyse the conversation and give correct meaning

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1										3				
2										2				
3										3				
4										2				
5										3				

UNIT I **9 Hours**

UNIT I

Introduction to Japanese - Japanese script- Pronunciation of Japanese(Hiragana)- (Katakana) Long vowels - Pronunciation of in,tsu,ga - Letters combined with ya,yu,yo - Daily Greetings and Expressions - Numerals. N1 wa N2 desu - N1 wa N2 ja arimasen - S ka N1 mo - N1 no N2 - san - Kore - Sore - Are - Kono N - Sono N - Ano N - Sou desu - Sou ja Arimasen - S1 ka - S2 ka - N1 no N2 - Sou desu ka - Koko - Soko - Asoko - Kochira - Sochira Achira - N1 wa N2 (place) desu - Doko - Dochira - N1 no N2 - Ko - So - A - Do (Demonstrative words) - O kuni Kanji10 - Technical Japanese Vocabulary (30 Numbers)

UNIT II **9 Hours**

UNIT II

Introduction to time - Ji - Fun - Pun - Introduction of verbs - V Masu - V Masen - V Mashita - V Masendeshita N (Time) Ni V - N1 Kara - N2 Made - N1 to N2 - S Ne - N (Place) e Ikimasu - Kimasu - Kaerimasu - Doko (e) Mo Ikimasen - Ikimasendeshita - N (Vechile) de Ikimasu - Kimasu - Kaerimasu - N (Person / Animal) to V - Itsu - S Yo N o (transitive) - N o Shimasu - Nani o Shimasuka - Nan and Nani - N (place) de V - V Masenka - V Mashou - o - Kanji 10 - Technical Japanese Vocabulary (30 Numbers) .

UNIT III **9 Hours**

UNIT III

N (tool/means) de V - Word/Sentence wa Go de Nani desu ka - N (person) Ni Agemasu, etc - N (person) Ni Moraimasu etc - Mou V Mashita - Introduction to Adjectives - N wa Na adj (Na) desu - N wa II adj (II) desu - Na adj Na n - II adj (II) N - Totemo - Amari - N wa Dou desuka - N1 wa Donna N2 desuka - S1 Ga S2 - Dore N ga Arimasu - Wakarimasu - N Ga Sukidesu - Kiraidesu - Jozu desu - Heta desu - Donna N - Yoku - Daitai - Takusan - Sukoshi - Amari - Zenzen - S1 kara S2 - Doushite - Kanji 10 - Technical Japanese Vocabulary (30 Numbers)

UNIT IV **9 Hours**

UNIT IV

N ga Arimasu - Imasu - N1 (place) Ni N2 ga Arimasu - Imasu - N1 (thing/person/place) no N2 (position) - N1 ya N2 - Word (s) desuka - Chirisosu wa Arimasuka - Saying numbers - Quantifier (period) Ni kai V - Quantifier Dake - N dake - Past tense of Noun sentences and Na adjective sentences - Past tense of ii adjective sentences - N1 wa N2 yori adjective desu - N1 to N2 to dochira ga adjective desu ka - N1/N2 no houga adjective desu - Kanji 10 - Technical Japanese Vocabulary (30 Numbers)

UNIT V **9 Hours**

UNIT V

N ga hoshi desu - V masu form tai desu - N (place) e V masu form - N Ni - ikimasu - kimasu - kaerimasu N ni V - N o V - dou ko ka - nani ka - go chuu mon - Verb conjugation - Verb groups - Verb te form - V te form kudasai - V te form imasu - V masu from mashouka - S1 ga S2 - N ga V - V te form mo ii desu - V te form wa ikemasen - V te form imasu Shrimasen - Kanji 10 - Technical Japanese Vocabulary (30 Numbers)

Total: 45 Hours

Text Book(s)

1. Japanese for Everyone: Elementary Main Textbook 1-2, Goyal Publishers and Distributors Pvt. Ltd., Delhi, 2007.

Reference(s)

1. Japanese for Everyone: Elementary Main Textbook1-1, Goyal Publishers and Distributors Pvt. Ltd., Delhi, 2007.

18HSC01 CHINESE 1 0 2 2

Course Objectives

- To help students appear for HSK Level 1 Exam
- To help students acquire the basics of Chinese language
- To teach the students how to converse in Chinese in various situations

Programme Outcomes (POs)

j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Differentiate individual sounds of Chinese
2. Apply basic sounds and words while speaking
3. Analyse short passages on familiar topics
4. Apply basic sentence structures while writing
5. Apply basic grammar and appropriate vocabulary in completing language tasks

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1										2				
2										3				
3										2				
4										2				
5										3				

UNIT I **9 Hours**

Hello | 1.Initials and Finals of Chinese | b,p,m,f,d,,n,l,g,k,h,j,q,x | 2. Tones Four | 3.Chinese Syllables | 4.Tone S

UNIT II **9 Hours**

Thank you | Initials and Finals of Chinese | The Neutral Tone | Rules of Tone Marking and Abbreviation

UNIT III **9 Hours**

1. What's your name - In the school; -In the classroom; -In the school | The Interrogative Pronoun | 2 The Sentence | 3 Interrogative Sentences with

UNIT IV **9 Hours**

She is my Chinese teacher | In the library | The Interrogative Pronouns | The Structural Particle | The interrogative Particle

UNIT V **9 Hours**

Her daughter is 20 years old this year | 1.The Interrogative Pronoun | 2. Numbers below 100 | 3.Indicating a Change | The Interrogative Phrase

Total: 45 Hours

18HSF01 FRENCH **1 0 2 2**

Course Objectives

- To prepare the students for DELF A1 Examination
- To teach them to converse fluently in French in day-to-day scenarios

Programme Outcomes (POs)

j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Analyze familiarity in the French alphabet & basic vocabulary
2. Differentiate individual sounds of French
3. Apply basic sounds and words while speaking
4. Analyse short passages on familiar topics
5. Apply basic grammar and appropriate vocabulary in completing language tasks

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1										2				
2										2				
3										3				
4										2				
5										3				

UNIT I **9 Hours**

ENTRER EN CONTACT

La langue francaise, alphabets, les numeros, les jours, les mois.| Grammaire Les verbes s appeler,etre, avoir, les articles definis, indefinis | Communication - Saluer, s informer sur quelquun, demander de se presenter | Lexique - Les alphabets, les nationalites, age, les pays, les couleurs, les jours de la semaine, les mois de l annee, les professions

UNIT II **9 Hours**

PARTAGER SON LIEU DE VIE

Les francais et leur habitat, des habitations insolites | Grammaire - Verbes - Conjugaison : Present (Avoir / etre /

ER, IR, RE : Regulier et Irregulier) - Adjectifs les propositions de lieu | Communication - Chercher un logement, d ecrire son voisin, s informer sur un logement | Lexique - L habitat, les pieces, l equipement, la description physique

UNIT III **9 Hours**

VIVRE AU QUOTIDIEN

Grammaire - Articles contractes, verbes vouloir, pouvoir, devoir, adjective interrogative, future proche | Communication- Exprimer ses gouts, parler de ses loisirs, justifier un choix, exprimer une envie | Lexique - le temps libre et les loisirs, les saisons, les activites quotidiennes, le temps (le matin, le soir, la nuit)

UNIT IV **9 Hours**

COMPRENDRE SON ENVIRONNEMENT - OUVRIR -Ãƒ?Ã‚Â LA CULTURE

Grammaire - Verbes - Finir, Sortir, les adjectifs demonstratifs, le passe compose, l imparfait | Communication - Propose quelqu un de faire quelque chose, raconteur une sortie au passe parler un film | Lexique - Les sorties, la famille, art, les vetements et les accessoires

UNIT V **9 Hours**

GOUTER A LA CAMPAGNE

Grammaire La forme negative, les verbes acheter, manger, payer, articles partitifs, le pronom en de quantite | Communication Accepter et refuse rune invitation, donner des instructions, commander au restaurant | Lexique Les services et les commerces, les aliments, les ustensiles, argent

Total: 45 Hours

Reference(s)

1. Saison A1, Methode de francais
2. Hachette FLE

PHYSICS ELECTIVES

18GE0P1 NANOMATERIALS SCIENCE 3 0 0 3

Course Objectives

- Impart knowledge on Nanoscience
- Explore different techniques of producing nanomaterials
- Create expertise on the applications of nanomaterials in various fields

Course Outcomes (COs)

1. Analyse the origin and advance of nanomaterials and its classification
2. Compare the different types of methods adopted for synthesizing nanomaterials
3. Analyse the characterization techniques for analyzing nanomaterials
4. Analyse the physical properties exhibited by nanomaterials
5. Analyze the nanomaterials developed for advanced technological applications

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1		2												

2														
3	3			2										
4		2					3							
5						1								

UNIT I **9 Hours**

NANO SCALE MATERIALS

Introduction-Feynman's vision-national nanotechnology initiative (NNI) - past, present, future -classification of nanostructures, nanoscale architecture - effects of the nanometer length scale - changes to the system total energy, and the system structures- effect of nanoscale dimensions on various properties -differences between bulk and nanomaterials and their physical properties.

UNIT II **9 Hours**

NANOMATERIALS SYNTHESIS METHODS

Top down processes - mechanical milling, nanolithography and types based on radiations - Bottom up process physical method: physical vapour deposition, RF sputtering, CVD- chemical method: colloidal and sol-gel methods - template based growth of nanomaterials - ordering of nanosystems, self-assembly and self-organization.

UNIT III **9 Hours**

CHARACTERIZATION TECHNIQUES

General classification of characterization methods - analytical and imaging techniques - microscopy techniques - electron microscopy, scanning electron microscopy, transmission electron microscopy, atomic force microscopy - diffraction techniques - X-ray spectroscopy - thermogravimetric analysis of nanomaterials.

UNIT IV **9 Hours**

SEMICONDUCTOR NANOSTRUCTURES

Quantum confinement in semiconductor nanostructures - quantum wells, quantum wires, quantum dots, super lattices-epitaxial growth of nanostructures-MBE, metal organic VPE, LPE - carbon nano tubes- structure, synthesis and electrical properties -applications- fuel cells - quantum efficiency of semiconductor nanomaterials

UNIT V **9 Hours**

NANOMACHINES AND NANODEVICES

Microelectromechanical systems (MEMS) and Nanoelectromechanical systems (NEMS)-fabrication, actuators-organic FET- principle, description, requirements, integrated circuits- organic LED: basic processes, carrier injection, excitons, optimization - organic photovoltaic cells- particulate and geometrical nanomagnets-magneto resistance.

Total: 45 Hours

Reference(s)

1. Willam A. Goddard, Donald W.Brenner, "Handbook of Nanoscience, Engineering, and Technology", CRC Press, 2012
2. Charles P. Poole Jr and. Frank J. Owens, "Introduction to Nanotechnology", Wiley Interscience, 2007
3. Guozhong Cao, Y. Wang, "Nanostructures and Nanomaterials-Synthesis, Properties & Applications", Imperials College Press, 2011.
4. T. Pradeep, "NANO: The Essentials Understanding Nanoscience and Nanotechnology", McGraw - Hill Education (India) Ltd, 2012

5. Robert W. Kelsall, Ian W. Hamley, Mark Geoghegan, "Nanoscale Science and Technology", John Wiley and Sons Ltd, 2006
6. Viswanathan B, Aulice Scibioh M, "Fuel cells: Principles and Applications", University Press, 2009.

18GE0P2 SEMICONDUCTOR PHYSICS AND DEVICES 3 0 0 3

Course Objectives

- Impart knowledge in physical properties of semiconducting materials
- Analyze the factors affecting the operation of semiconductor devices
- Apply the physics of semiconductors to develop semiconductor devices

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Analyse the band gap, drift and diffusion current densities due to carrier transport in semiconductors
2. Analyze the energy band diagram in thermal equilibrium and space charge width of PN junction
3. Apply the operation of Bipolar Junction transistor at different modes and different configurations
4. Apply the operation of metal oxide field effect transistor and their memory devices
5. Analyse the working mechanism of opto-electronic devices

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	1												
2	1	2												
3	1	1												
4	1	1												
5	2	1												

UNIT I **9 Hours**

ENERGY BANDS AND CARRIER TRANSPORT PROPERTIES

Energy Bands: Formation of energy bands - doping effects - energy levels - electron and hole concept in semiconductor. Carrier transport: Carrier drift-drift current density - conductivity- diffusion current density - total current density

UNIT II **9 Hours**

P-N JUNCTION

Basic structure and fabrication process of p-n junction - current - voltage characteristics - energy band diagram - equilibrium Fermi levels - depletion region - junction breakdown phenomena - zener - avalanche breakdown.

UNIT III **9 Hours**

BIPOLAR JUNCTION TRANSISTOR

The basic transistor action - operation in the active mode - current gain - static characteristics - carrier distribution in emitter, base and collector region - modes of operation - current - voltage characteristics of common base and emitter configuration - frequency response and switching of bipolar transistor

UNIT IV **9 Hours**

MOSFET

The ideal MOS diode - basic fundamentals and characteristics - types - CMOS and BiCMOS - CMOS inverter - MOSFET on insulator - thin film transistor (TFT) - silicon on insulators (SOI) devices - MOS Memory structures - DRAM and SRAM

UNIT V **9 Hours**

PHOTONIC DEVICES

Radiative transitions and optical absorption-light emitting diodes-organic LED - infrared LED – semiconductor laser - temperature effect - photo detector - photo diode - silicon and compound semiconductor solar cells - efficiency

Reference(s)

1. Donald A Neamen, "Semiconductor Physics and Devices", Tata McGraw Hill, 2012
2. S. M. Sze and M. K.Lee, "Semiconductor Devices, Physics and Technology", John-Wiley & Sons, 2015
3. Ben. G. Streetman and S. K. Banerjee , "Solid State Electronic Devices", Pearson Education Ltd, 2015
4. C. Kittel, "Introduction to Solid State Physics", John-Wiley & Sons, 2012
5. J. Millman and C. Halkias, "Electronic Devices and Circuits", Tata McGraw Hill, 2010
6. Hagen Klauk, "Organic Electronics: Materials, Manufacturing and Applications", Wiley-VCH, 2006

18GE0P3 APPLIED LASER SCIENCE **3 0 0 3**

Course Objectives

- Impart knowledge on laser science
- Explore different strategies for producing lasers
- Create expertise on the applications of lasers in various fields

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences

Course Outcomes (COs)

1. Analyse the transition mechanisms and the components of a laser system
2. Compare the different types of lasers based on pumping method, active medium and energy levels
3. Compute the rotation of earth, velocity and distance using lasers and apply the same for day today applications
4. Analyze the role of lasers in surgical and endoscopy applications
5. Apply the laser techniques in industrial applications

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	1												
2	1	2												
3	2	1												
4	1	1												
5	1	2												

UNIT I **9 Hours**

LASER FUNDAMENTALS

Introduction - principle - absorption and emission of light - thermal equilibrium - Einstein"s prediction - Einstein"s relations - A and B coefficients - condition for large stimulated emission - spontaneous and stimulated emission in optical region - light amplification - condition for light amplification - population inversion- Components of lasers - pumping methods - pumping mechanisms - optical resonator

UNIT II **9 Hours**

LASER BEAM CHARACTERISTICS AND TYPES

Characteristics of laser - Classification of lasers - principle, construction, working, energy level diagram and applications of molecular gas laser (CO2 laser) - liquid laser (dye laser) - excimer laser - Solid State laser (Nd:YAG laser) - semiconductor laser (homojunction laser).

UNIT III **9 Hours**

LASERS IN SCIENCE

Introduction - Harmonic generation (SHG) - Stimulated Raman emission - lasers in chemistry - laser in nuclear energy - lasers and gravitational waves - rotation of the earth - measurement of distance - Light detection And Ranging (LIDER) - velocity measurement - holography

UNIT IV **9 Hours**

LASERS IN MEDICINE AND SURGERY

Light induced biological hazards: Eye and skin - Eye laser surgery - photocoagulations - homeostasis - dentistry - laser angioplasty - different laser therapies - advantages & disadvantages - laser endoscopy.

UNIT V **9 Hours**

LASERS IN INDUSTRY

Applications in material processing: laser welding - hole drilling - laser cutting- Lasers in electronics industry: information storage - bar code scanner- Lasers in defence: laser based military weapons - laser walls.

Total: 45 Hours

Reference(s)

1. K. Thiyagarajan and A. K. Ghatak, "LASERS: Fundamentals and Applications", Springer, USA, 2015
2. M. N. Avadhanulu, "An Introduction to Lasers Theory and Applications", S. Chand Publisher, 2013
3. W. Koechner, M. Bass, "Solid State Lasers: a graduate text", Springer Verlag, New York, 2006
4. K. P. R. Nair, "Atoms, Molecules and Lasers", Narosa Publishing House, 2009
5. K. R. Nambiar, "Lasers: Principles Types and Applications", New Age International Publications, 2006
6. A. Sennaroglu, "Solid-State Lasers and Applications", CRC Press, 2006.

CHEMISTRY ELECTIVES

18GE0C1 CORROSION SCIENCE AND ENGINEERING 3 0 0 3

Course Objectives

- Analyse the loss incurred due to corrosion in different sectors and terminologies related to corrosion
- Identify forms and types of corrosion with suitable mechanism
- Apply various methods of corrosion control, corrosion testing and monitoring

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
g. g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Course Outcomes (COs)

1. Evaluate if corrosion can occur under specific operating conditions in a given equipment or construction and indicate regions of immunity, corrosion and passivity of a metal
2. Compare different corrosion types on metals when exposed to air, water and at high temperatures (> 100 C)
3. Analyse the corrosion mechanism on steel, iron, zinc and copper metal surfaces
4. Evaluate the rate of corrosion on metals using electrochemical methods of testing
5. Find the correct materials, design and operation conditions to reduce the likelihood of corrosion in new equipment and constructions

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	1												
2	2						1							
3	1	3												
4	2	2												
5	3	3					1							

UNIT I **9 Hours**

CORROSION

Importance of corrosion - spontaneity of corrosion - units of corrosion rate (mdd and mpy) - direct and indirect damage by corrosion - importance of corrosion prevention in industries - Pilling Bedworth ratio and its significance - passivation - area relationship in both active and passive states of metals - Pourbaix digrams of Mg, Al and Fe and their advantages and disadvantages

UNIT II **7 Hours**

TYPES OF CORROSION

Eight forms of corrosion: uniform, galvanic, crevice corrosion, pitting, intergranular corrosion, selective leaching, erosion corrosion and stress corrosion-Catastrophic oxidation corrosion

UNIT III **9 Hours**

MECHANISM OF CORROSION

Hydrogen embrittlement - corrosion fatigue - filiform corrosion - fretting damage and microbes induced corrosion. Corrosion mechanism on steel, iron, zinc and copper metal surfaces

UNIT IV **10 Hours**

CORROSION RATE AND ITS ESTIMATION

Rate of corrosion: Factors affecting corrosion. Electrochemical methods of polarization: Tafel extrapolation polarization and linear polarization. Weight loss method - testing for intergranular susceptibility and stress corrosion. Nondestructive testing methods: Visual testing - liquid penetrant testing - magnetic particle testing - Ultrasonic monitoring, Quantitative testing , Quantitative testing and eddy current testing

UNIT V **10 Hours**

CORROSION CONTROL METHODS

Fundamentals of cathodic protection - types of cathodic protection (sacrificial anodic and impressed current cathodic protection). Stray current corrosion, problems and its prevention. Protective coatings: Metal coatings: Hot dipping (galvanizing, tinning and metal cladding) - natural inhibitors. Selection of suitable design for corrosion control

FOR FURTHER READING

Corrosion issues in supercritical water reactor (SCWR) systems

Total: 45 Hours

Reference(s)

1. Mouafak A. Zaher, "Introduction to Corrosion Engineering", Create Space Independent Publishing Platform, 2016.
2. E.McCafferty, "Introduction to Corrosion Science", Springer; 2010 Edition, January 2010.
3. R. Winstone Revie and Herbert H. Uhlig, "Corrosion and Corrosion Control: An Introduction to Corrosion Science and Engineering", 4th Edition, John Wiley & Science, 2008.
4. Mars G. Fontana, "Corrosion Engineering", Tata McGraw Hill, Singapore, 2008
5. David E.J. Talbot (Author), James D.R. Talbot, "Corrosion Science and Technology", Second Edition (Materials Science & Technology), CRC Press; 2nd Edition, 2007.
6. http://corrosion-doctors.org/Corrosion-History/Eight.htm

18GE0C2 ENERGY STORING DEVICES 3 0 0 3

Course Objectives

- Understand the concept, working of different types of batteries and analyze batteries used in electric vehicles
- Identify the types of fuel cells and to relate the factors of energy and environment
- Analyze various energy storage devices and fuel cells

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Analyse the parameters required for operation of a cell to evaluate the capacity of energy storage devices
2. Evaluate the electrodes, electrolyte and cell reactions of different types of primary, secondary batteries and do the selection criteria for commercial battery systems with respect to commercial applications
3. Differentiate fuel cells based on its construction, production of current and applications
4. Compare different methods of storing hydrogen fuel and its environmental applications
5. Analyse energy and environmental based on the importance and types of renewable energy for sustainable development

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	1												
2	2	3												
3	3	1												
4	2	2												
5	3	3												

UNIT I **6 Hours**

BASICS OF CELLS AND BATTERIES

Components - classification - operation of a cell - theoretical cell voltage - capacity - specific energy - energy density of lithium and lead acid battery - charge efficiency- charge rate - charge retention - closed circuit voltage, open circuit voltage current density - cycle life - discharge rate-over charge-over discharge

UNIT II **10 Hours**

BATTERIES FOR PORTABLE DEVICES AND ELECTRIC VEHICLES

Primary batteries - zinc-carbon, magnesium, and mercuric oxide - recycling/safe disposal of used cells. Secondary batteries - introduction, cell reactions, cell representations and applications - lead acid, nickel-cadmium and lithium ion batteries - rechargeable zinc alkaline battery. Reserve batteries: Zinc-silver oxide, lithium anode cell, photo galvanic cells. Battery specifications for cars and automobiles

UNIT III **10 Hours**

TYPES OF FUEL CELLS

Importance and classification of fuel cells - description, working principle, components, applications and environmental aspects of the following types of fuel cells: alkaline fuel cells, phosphoric acid, solid oxide, molten carbonate and direct methanol fuel cells

UNIT IV **10 Hours**

HYDROGEN AS A FUEL

Sources and production of hydrogen - electrolysis - photocatalytic water splitting - methods of hydrogen storage- high pressurized gas - liquid hydrogen type - metal hydride - hydrogen as engine fuel - features, application of hydrogen technologies in the future - limitations

UNIT V **9 Hours**

ENERGY AND ENVIRONMENT

Future prospects of renewable energy and efficiency of renewable fuels - economy of hydrogen energy. Solar Cells: First, second, third and fourth generation solar cell - photo biochemical conversion cell

Total: 45 Hours

Reference(s)

1. M. Aulice Scibioh and B. Viswanathan, Fuel Cells: Principles and Applications, University Press, India, 2009
2. F. Barbir,PEM fuel cells: Theory and practice, Elsevier, Burlington, MA, Academic Press, 2013
3. M. R. Dell Ronald and A. J. David, Understanding Batteries, Royal Society of Chemistry, 2001
4. J. S. Newman and K. E. Thomas-Alyea, Electrochemical Systems, Wiley, Hoboken, NJ, 2012

5. Shripad T. Revankar, Pradip Majumdar, Fuel Cells: Principles, Design, and Analysis, CRC Press, 2016
6. Thomas B. Reddy, Linden's Handbook of Batteries, 4th Edition, McGraw Hill Professional, 2010

18GE0C3 POLYMER SCIENCE 3 0 0 3

Course Objectives

- Explain the properties of different polymers with its mechanism
- Select the appropriate polymerization techniques to synthesize the polymers and its processing
- Identify suitable polymers for various industrial applications

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Course Outcomes (COs)

1. Analyse the types of mechanism of polymerization reactions and analyze the natural and synthetic polymers
2. Apply the suitable polymerization techniques to synthesize the high quality polymers
3. Differentiate the polymers to identify the structural, thermal ,mechanical and electrical features for specific applications
4. Apply the polymer processing methods to design polymer products
5. Analyze the polymers used in electronic and biomedical applications

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	1												
2	1	2												
3	2	2												
4	1	1	2											
5	1	3	2											

UNIT I **10 Hours**

POLYMERS AND ELASTOMERS

Classification of polymers - Mechanism: Addition polymerization - free radical, cationic, anionic and co-ordination (Ziegler-Natta) polymerization - copolymerization - condensation polymerization (nylon-6,6) -ring opening polymerization (nylon-6). Elastomers: Natural rubber and synthetic rubber: styrene -butadiene rubber (SBR), butyl, neoprene, thiocol rubbers. High performance polymers: polyethers, polyether ether ketone (PEEK), polysulphones and polyimides

UNIT II **8 Hours**

POLYMERIZATION TECHNIQUES

Homogeneous and heterogeneous polymerization - bulk polymerization (PMMA, PVC) - solution polymerization - polyacrylic acid, suspension polymerization (ion-exchange resins) - emulsion polymerization (SBR) - advantages and disadvantages of bulk and emulsion polymerization. Melt solution and interfacial poly-condensation

UNIT III **8 Hours**

CHARACTERIZATION AND TESTING

Characterization of polymers by Infrared Spectroscopy (IR) and Nuclear Magnetic Spectroscopy (NMR) - Thermal properties: TGA and DSC - Testing tensile strength - Izod impact - Compressive strength - Rockwell hardness - Vicot softening point. Test for electrical resistance, dielectric constant, dissipation factor, arc resistance and dielectric strength - water absorption

UNIT IV **9 Hours**

POLYMER PROCESSING

Moulding: Compression - injection - extrusion and blow mouldings. Film casting - calendering. Thermoforming and vacuum formed polystyrene - foamed polyurethanes. Fibre spinning: melt, dry and wet spinning. Fibre reinforced plastics fabrication: hand-layup - filament winding and pultrusion

UNIT V **10 Hours**

SPECIALITY POLYMERS

Preparation and properties of heat resistant and flame retardant polymers. Polymers for electronic applications: liquid crystalline, conducting and photosensitive polymers. Polymer for biomedical applications: artificial organs, controlled drug delivery, hemodialysis and hemofiltration - Scaffolds in tissue Engineering.

FOR FURTHER READING

Biodegradable polymers

Total: 45 Hours

Reference(s)

1. V. R. Gowarikar, N. V. Viswanathan and Jayadev Sreedhar, "Polymer Science", New Age International (P) Ltd., New Delhi, 2015
2. Joel R. Fried, "Polymer Science and Technology", Prentice Hall of India (P). Ltd., 2014
3. F. W. Billmeyer,"Text Book of Polymer Science", John Wiley & Sons, New York, 2007
4. Barbara H. Stuart, "Polymer Analysis", John Wiley & Sons, New York, 2008
5. George Odian , "Principles of Polymerization", John Wiley & Sons, New York, 2004
6. R. J. Young and P. A. Lovell, "Introduction to Polymers", CRC Press, New York, 2011

18GE0M2 ALGEBRA AND NUMBER THEORY 3 0 0 3

Course Objectives

- Understand the basic notions of groups, rings, fields which will then be used to solve related problems.
- Examine the key questions in the Theory of Numbers.

- Implement the integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.

Course Outcomes (COs)

1. Apply the concepts of groups and fields in the areas of Engineering.
2. Differentiate the different types of fields.
3. Organize the divisibility in number theory in various areas of Engineering.
4. Apply the solution of some kinds of equations.
5. Demonstrate the theorems in number theory.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1														
2														
3														
4														
5														

UNIT I **9 Hours**

FIELDS

Group Theory - Rings and Polynomials - Fields.

UNIT II **9 Hours**

FINITE FIELDS AND POLYNOMIALS

Finite Fields - Irreducible Polynomials over Finite fields - Factorization of Polynomials over Finite Fields.

UNIT III **9 Hours**

DIVISIBILITY THEORY AND CANONICAL DECOMPOSITIONS

Division algorithm- Base-b representations - number patterns - Prime and composite numbers - Fibonacci and Lucas numbers - Fermat numbers - GCD - Euclidean Algorithm - Fundamental theorem of Arithmetic - LCM.

UNIT IV **8 Hours**

DIOPHANTINE EQUATIONS AND CONGRUENCES

Linear Diophantine equations - Congruence s - Linear Congruence s - Applications: Divisibility tests - Modular Designs - Chinese remainder theorem - 2x2 linear systems.

UNIT V **10 Hours**

CLASSICAL THEOREMS AND MULTIPLICATIVE FUNCTIONS

Wilson s theorem - Fermat s Little theorem - Euler s theorem - Euler s Phi functions - Tau and Sigma functions - Perfect numbers - Mersenne Primes - Mobius Function.

Total: 45 Hours

Reference(s)

1. Lidl.R., and Pilz. G., Applied Abstract Algebra, Springer-Verlag, New Delhi, 2nd Edition, 2006.

2. Thomas Koshy, Elementary Number Theory with Applications, Elsevier Publications, New Delhi, 2002.
3. San Ling and Chaoping Xing, Coding Theory: A first Course, Cambridge Publications, Cambridge, 2004.
4. Niven.I, Zuckerman.H.S., and Montgomery, H.L., An Introduction to Theory of Numbers, John Wiley and Sons, Singapore, 2004.

18GE0M3 MATHEMATICAL FINANCE AND QUEUEING THEORY

3 0 0 3

Course Objectives

- To provide the required fundamental concepts in probability and queueing models and apply these techniques in networks, image processing etc.
- Acquire skills in analyzing queueing models.

Course Outcomes (COs)

1. Analyse the properties of stochastic process in finance
2. Apply the concept and applications of Statistics in finance.
3. Demonstrate the basics of finance using the notions of statistics.
4. Assess the classifications and the properties of queues.
5. Apply the concepts of queue in open and closed networks.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												
2	3	2												
3	3	2												
4	3	2												
5	3	2												

UNIT I **9 Hours**

APPLIED STOCHASTIC CALCULUS

Brownian motion - Constructions - Non differentiability - Quadratic variation - Stochastic integration - Construction of Ito integral and properties ,the Ito formula - Feynman-Kac formula

UNIT II **9 Hours**

STATISTICS

Basic parameter estimation - Maximum likelihood estimation - Distributions - Regression techniques - Tests for normality - QQ plots - Hypothesis testing - Numerical examples in R.

UNIT III **9 Hours**

CONTINUOUS-TIME FINANCE

Black-Scholes-Merton model of stock prices as geometric Brownian motion, derivation of the Black-Scholes-Merton partial differential equation, the Black-Scholes formula and simple extensions of the model, self-financing strategies and model completeness, risk neutral measures, the fundamental theorems of asset pricing, continuous time optimal stopping and pricing of American options, forwards and futures in Black-Scholes-Merton model.

UNIT IV **9 Hours**

QUEUEING THEORY

Markovian queues - Birth and Death processes - Single and multiple server queueing models - Little s formula - Queues with finite waiting rooms - Finite source models.

UNIT V **9 Hours**

NON-MARKOVIAN QUEUES AND QUEUEING NETWORKS

M/G/1 queue - Pollaczek Khinchin formula - M/D/1 and M/EK/1 as special cases - Series queues - Open and closed Jackson networks.

Total: 45 Hours

Reference(s)

1. M. Capinski and T. Zastawniak, Mathematics for Finance: An Introduction to Financial Engineering, Springer, 2005.
2. S. Shreve, Stochastic Calculus for Finance, Vol. 1 and Vol. 2, Springer, 2004.
3. G. R. Grimmett and D. R. Stirzaker, Probability and Random Processes, 3rd Edition, Oxford University Press, 2001.
4. Taha, H.A., Operations Research, Pearson Education, Asia, 8th Edition, 2007.

18GE0E1 ENTREPRENEURSHIP DEVELOPMENT I 3 0 0 3

Course Objectives

- Study of this subject provides an understanding of the scope of an entrepreneur, key areas of development, financial assistance by the institutions, methods of taxation and tax benefits, etc

Course Outcomes (COs)

1. Analyze the role of entrepreneurship in economic development.
2. Differentiate the types of ideas that to be used for entrepreneurship development.
3. Analyse the legal aspects of business and its association.
4. Analyse the sources of business and its analysis.
5. Analyse the different modes of operation management.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												
2	3	2												
3	3	2												
4	3	2												
5	3	2												

UNIT I **9 Hours**

BASICS OF ENTREPRENEURSHIP

Nature, scope and types of Entrepreneurship, Entrepreneur Personality Characteristics, Entrepreneurship process. Role of entrepreneurship in economic development

UNIT II **9 Hours**

GENERATION OF IDEAS

Creativity and Innovation, Lateral Thinking, Generation of Alternatives, Fractional, Reversal Method, Brain Storming, Analogies

UNIT III **9 Hours**

LEGAL ASPECTS OF BUSINESS

Contract act-Indian contract act, Essential elements of valid contract, classification of contracts, sale of goods act- Formation of contract of sale, negotiable instruments- promissory note, bills and cheques, partnership, limited liability partnership (LLP), companies act-kinds, formation, memorandum of association, articles of association.

UNIT IV **9 Hours**

BUSINESS FINANCE

Project evaluation and investment criteria (cases), sources of finance, financial statements, break even analysis, cash flow analysis.

UNIT V **9 Hours**

OPERATIONS MANAGEMENT

Importance- functions-deciding on the production system- facility decisions: plant location, plant layout (cases), capacity requirement planning- inventory management (cases)-lean manufacturing, Six sigma.

Total: 45 Hours

Reference(s)

1. Hisrich, Entrepreneurship, Tata McGraw Hill, New Delhi: 2005
2. Prasanna Chandra, Projects Planning, Analysis, Selection, Implementation and Reviews, Tata McGraw-Hill Publishing Company Limited, New Delhi: 2000.
3. Akhileshwar Pathak, Legal Aspects of Business, Tata McGraw Hill: 2006

18GE0E2 ENTREPRENEURSHIP DEVELOPMENT II 3 0 0 3

Course Objectives

- Evolve the marketing mix for promoting the product / services
- Handle the human resources and taxation
- Understand Government industrial policies / support provided and prepare a business plan

Course Outcomes (COs)

1. Analyse the strategies and plans in marketing management.
2. Analyse the cases involved in human resource management.
3. Differentiate the direct and indirect taxes in business.

4. Analyze the supports given by government for improving the business.
5. Apply the various steps involved in preparing the business plan.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1														
2														
3														
4														
5														

UNIT I **9 Hours**

MARKETING MANAGEMENT

Marketing environment, Segmentation, Targeting and positioning, Formulating marketing strategies, Marketing research, marketing plan, marketing mix (cases)

UNIT II **9 Hours**

HUMAN RESOURCE MANAGEMENT

Human Resource Planning (Cases), Recruitment, Selection, Training and Development, HRIS, Factories Act 1948 (an over view)

UNIT III **9 Hours**

BUSINESS TAXATION

Direct taxation, Income tax, Corporate tax, MAT, Tax holidays, Wealth tax, Professional tax (Cases).Indirect taxation, Excise duty, Customs, Sales and Service tax, VAT, Octroi, GST (Cases

UNIT IV **9 Hours**

GOVERNMENT SUPPORT

Industrial policy of Central and State Government, National Institute-NIESBUD, IIE, EDI. State Level Institutions-TIIC, CED, MSME, Financial Institutions

UNIT V **9 Hours**

BUSINESS PLAN PREPARATION

Purpose of writing a business plan, Capital outlay, Technical feasibility, Production plan, HR plan, Market survey and Marketing plan, Financial plan and Viability, Government approvals, SWOT analysis.

Total: 45 Hours

Reference(s)

1. Hisrich, Entrepreneurship, Tata McGraw Hill, New Delhi: 2005
2. Philip Kotler., Marketing Management, Prentice Hall of India, New Delhi: 2003
3. Aswathappa K, Human Resource and Personnel Management - Text and Cases, Tata McGraw Hill: 2007.
4. Jain P C., Handbook for New Entrepreneurs, EDII, Oxford University Press, New Delhi: 2002.

5. Akhileshwar Pathak, Legal Aspects of Business, Tata McGraw Hill: 2006.
6. http://niesbud.nic.in/agencies.htm

DISCIPLINE ELECTIVES

18FT001 HOME FURNISHINGS 3 0 0 3

Course Objectives

- Students will have fundamental knowledge on home furnishings.
- Students will know the various designs / styles of bed linen, bath linen, kitchen linen, table linen and living room furnishings.
- Students will acquire knowledge on various flammability requirements of home furnishings.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Course Outcomes (COs)

1. Analyse the home furnishing on the basis of performance requirements
2. Evaluate the quality parameters of home furnishing and clients requirements.
3. Demonstrate different home furnishing products by their design value.
4. Differentiate bedroom, kitchen and bathroom furnishings by their design and style.
5. Analyse flammability requirements of home furnishings.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												
2	3	2	1											
3	3	2	1											
4	3	2	1											
5	3	2												

UNIT I **9 Hours**

INTRODUCTION

Concept of home furnishing, Classification, Fibres and fabrics used in various home furnishing, Performance specifications of different home furnishings: Importance of performance specification, Performance requirements of US, UK and Canada market, Special performance requirements: Wrinkle resistance, Stain Repellency, Stain Resistance, Stain Release, Anti-allergen, Moisture wicking, Water repellency and Water resistance, Labelling issues of home textiles.

UNIT II **9 Hours**

BED LINEN

Types- Bed Skirt, Bed Cover, Bed Sheet, Bed Spread, Mattress, Mattress Pad, Mattress Protector, Throw (Small blanket), Duvet, Duvet Cover, Comforter, Comforter Cover, Quilt, Quilt Cover, Blanket, Blanket Cover, Pillow , Pillow Cover, Sham, Mosquito Net. Recommended care of bed linen.

UNIT III **9 Hours**

BATH LINEN AND KITCHEN LINEN

Bath linen: Types, Shower Curtain, Bath Robe, Bath Towels, Bath Mats, Bath Rugs, Face Towels and Hand Towels. Kitchen Linen: Apron, Mitten, Napkin, Dish Cloth, Pot Holder, Place Mat, Kitchen Towel, Coaster, Tea Coyz, Placemat. Recommended care of bath and kitchen linen.

UNIT IV **9 Hours**

TABLE LINEN AND LIVING ROOM FURNISHINGS

Table Pad, Table Protector, Table Cloth, Table Runner, Table Skirt, Table Mat, Chair Cover, Chair Mat, Chair Pad, Sofa Cover, Cushion, Cushion Cover, Teapoy cover, Bolster, Wall coverings. Floor covering: Classification, Hard floor covering Resilient, Manmade and natural stone flooring, Soft floor covering carpets and rugs. Recommended care of table linen and living room furnishings.

UNIT V **9 Hours**

FLAMMABILITY OF HOME FURNISHINGS

Introduction, Flammability regulations for different home furnishings: Resilient cellular material, Bean bags, Man-made and Non Man-made filling materials, Cigarette Test, Smouldering screening test, Flammability test of carpets, rugs, blankets, towels, mattress and mattress pad, bed-clothing and curtains.

Total: 45 Hours

Reference(s)

1. Subrata Das, Performance of Home Textiles Ã¢?? Second Edition, Woodhead Publishing Pvt. Ltd, 2018
2. T Rowe, Interior textiles- Design and Developments, Woodhead Publishing Pvt. Ltd, 2009
3. Jay Diamond and Ellen Diamond, Fashion Apparel, Accessories, Home Furnishings, Pearson Prentice Hall, New Jersey, 2007.
4. Elsasser and Virginia Hencken, Know Your Home Furnishings, Fairchild Books & Visuals, September, 2003
5. Hamlym, Bed and Table linen, Octopus Publishing Group Ltd, Newyork 2001
6. Cargill and Katrin, Home Furnishing Workbook: Featuring 32 Step-by-step Textile Furnishing Projects, Rayland Peters and Small, USA, 2001.

18FT002 CLOTHING COMFORT 3 0 0 3

Course Objectives

- To understand the fiber, yarn and fabric properties that influence the fabric comfort
- To enrich the knowledge on testing, analyzing and predicting the comfort properties of textiles.
- To exemplify the thermal comfort, sensorial comfort and movement comfort

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Analyse the functions of comfort in clothing
2. Analyze the material composition that contributes to comfort
3. Evaluate the contribution of fiber properties to comfort
4. Analyse the tactile and body movement comfort
5. Determine comfort requirements in intimate apparel

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												
2	3	2												
3	3	2												
4	3	2												
5	3	2												

UNIT I **9 Hours**

HUMAN PHYSIOLOGY AND THE ROLE OF CLOTHING

Definition of comfort, Human physiological aspect of comfort, Energy metabolism and physical work, Human heat balance, Clothing as near environment, Various aspects of clothing comfort, Comfort variables, Effective temperature and comfort chart, Response to extreme temperature, Development of heat stress and its control, Protective clothing

UNIT II **9 Hours**

PROPERTIES OF FIBERS AND FABRICS THAT CONTRIBUTE TO HUMAN COMFORT

Comfort properties of fibers, Physical modification of fibers, Comfort properties of yarns, Comfort properties of fabric structures. Improving moisture management in apparel: Transport of perspiration, Fundamentals of moisture transfer between human body and environment, Factors influencing moisture transport, Improving moisture transport, and Clothing requirements for different environmental conditions.

UNIT III **9 Hours**

TESTING, ANALYZING AND PREDICTING THE COMFORT PROPERTIES OF TEXTILES

Measurement of thermo-physiological comfort: Thermo-physiological comfort, Thermal resistance, Water vapour transport, Air permeability, wicking, buffering and absorbency. Characterization of comfort, Testing, analyzing and predicting neurophysiologic comfort, Testing, analyzing and predicting thermo physiological comfort, Design-oriented comfort model.

UNIT IV **9 Hours**

GARMENT PATTERN DESIGN AND COMFORT

Fundamental principles of fit in apparel, Clothing comfort and fit, Manual and mechanical stretch testing, Stretch pattern. Improving body movement comfort in apparel: Fundamental principles of movement in apparel,

fashion and functional apparel: aesthetics, protection, performance and movement, Materials and design strategies to provide appropriate movement performance, Movement and garment, stretch/pressure/compression

UNIT V **9 Hours**

ACHIEVING COMFORT IN INTIMATE APPAREL

Sensorial comfort for intimate apparel, Thermal comfort for intimate apparel, Motion comfort for intimate apparel, Aesthetical comfort for intimate apparel, Hygienic comfort for intimate apparel

FOR FURTHER READING

Comfort parameters, Comfort properties of defense fabrics, Recent testing methods, New engineering techniques to increase tactile comfort in fabrics, Medical comfort with functional properties

Total: 45 Hours

Reference(s)

1. Guowen Song, Improving comfort in clothing, The Textile Institute and Woodhead Publishing, UK,2011
2. Apurba Das, R. Alagirusamy, Science in Clothing Comfort, Woodhead Publishing Limited, Abington Hall, Granta Park, Great Abington, Cambridge, UK,2010
3. Radostina A. Angelova,Textiles and Human Thermophysiological Comfort in the Indoor Environment,CRC Press, Taylor & Francis Group,2015
4. P. Elsner and K. L. Hatch, Textiles and the Skin, Karger Publications, UK,2003
5. Y. Li, The Science of Clothing Comfort, Textile Progress, Vol.31, Textile Institute, 2001

18FT003 FASHION COMMUNICATION 3 0 0 3

Course Objectives

- Equip the students about the fundamental fashion communication concepts.
- Enable the students to choose graphics and presentation concepts for disseminating fashion information
- Acquire the knowledge of writing fashion journal articles.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
f. f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology,

production and management.

Course Outcomes (COs)

1. Analyse the fashion communication concepts in design and articulate the framework of process parameters engaged in design.
2. Apply the graphic design concepts and resolve the layout & typography requirements for presenting fashion concepts
3. Analyse the visual merchandising requirements for making an effective visual display in both brick stores and online
4. Determine the documentation processes and review processes for reporting and publishing in journals.
5. Analyse the fashion photography aspects and examine the light settings & camera parameters for organizing fashion photo shoots, choreography and fashion motion photography.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2			2	1		2					2	2
2	3	2			2	1		2					2	
3	3	2			3	2		2					3	2
4	3	3			2	2		2					3	2
5	3	3			2	2		2					3	2

UNIT I **9 Hours**

FASHION COMMUNICATION IN DESIGN

Communication concepts and processes - Mood board, Trend board, Sketches, Tech pack, Look book, Styling, Catalogue, Brochure

UNIT II **9 Hours**

GRAPHIC DESIGN FOR PRESENTATION

Grids and formations columns, grids, modules. Types of grids, Layout design gestalt principles, reality layouts and representational layouts. Matrices patterns, pixels and pointillism. Typography anatomy, types.

UNIT III **9 Hours**

VISUAL MERCHANDISING

Different kinds of images, Display types. Display setting types. Elements of Display Mannequins, dress forms, stands Ã¢?? T stand, 4 way stand, rounder, spiral stands. Color planning for store interiors.

UNIT IV **9 Hours**

FASHION JOURNALISM

Writing runway reviews, Fashion week reviews, Trend reporting trend labeling, trend mapping and trend quality. Writing editorials, Framing advertisement contents, Craft documentation, Writing design coverage report, Writing travelogues, lifestyle reporting.

UNIT V **9 Hours**

FASHION PHOTOGRAPHY

Street photography, Choreography for fashion shows, fashion photo shoot, Subject lighting, Guidelines for selecting lighting conditions for different moods. Motion photography.

Total: 45 Hours

Text Book(s)

1. Sanda Miller, Fashion journalism: History, Theory and Practice, Bloomsbury publishing, 2018.

Reference(s)

1. Kate Nelson Bet, The history and fashion journalism, Berg publishers, 2017.
2. Harriet Posner, Marketing Fashion: Strategy, Branding and Promotion, Laurence king publishing, 2015. 2nd edition
3. Alicia Kennedy, Emily stoehrer, Jay calderin, Fashion design referenced, Rockport publishers, 2013.
4. Marian Frances Wolbers, Uncovering fashion: Fashion communications across the media, Fairchild books, 2009.
5. Https://www.globalfashionagenda.com

18FT004 FASHION STYLING AND MODELING 3 0 0 3

Course Objectives

- To enable the Students identify fashion ideas and styling trends
- To impart the knowledge of formulating different looks.
- To enable the Students derive fashion show presentation concepts.

Programme Outcomes (POs)

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

l. l. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Apply knowledge of various styling concepts in the history of fashion design
2. Analyse the characteristic features of subcultures.
3. Create new concepts for style development devise photo shoot techniques for presentation themes.
4. Analyse the model requirements for runway, high fashion and catalogue modeling.
5. Analyze the characteristics of concept photoshoot styling and create new looks inspired from the fashion runways.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1												1	3	
2		1			2								3	
3									1	2			3	
4										2			3	
5					2					2			3	

UNIT I **9 Hours**

INTRODUCTION TO FASHION DESIGN HISTORY

Evolution of fashion from 17th century to the current: major silhouettes, shapes, colors, garment detail and look. Fashion categories and Clothing genres Active wear, swimwear, sportswear separates, dresses, suits, evening wear, outerwear. Core visual fashion concepts ethnic, postmodern, avant-garde, historic, modernity, sexuality and sporty.

UNIT II **9 Hours**

FASHION SUBCULTURES

Review of notable fashion icons - 20 designers and fashion Innovators - 20 designers. Styles from the street, subculture and aesthetics: The Dandy, Hiphop, Skater, Grunge, Punk, Fetish, Goth, steam punk, Japanese style tribes, Minimalist, Classic, romantic, sporty, urban, postmodern, Deconstructivist

UNIT III **9 Hours**

FASHION CHOREOGRAPHY

Fashion choreography concept development, Create visual art plans and presentation themes, Design briefing and content development, Photo shooting, Choosing models, Selection criteria for makeup concept.

UNIT IV **9 Hours**

FASHION MODELING

Fashion modeling types: Editorial fashion modeling, High fashion modeling (runway, ad campaign), catalog modeling.Fashion model size requirements, working on expression and pose, art of posing, posing styles. Enhancing physical features through styling

UNIT V **9 Hours**

PREPARATION OF MODELING AND STYLING PORTFOLIO

Conceptual styling, coordinating with themes, choosing accessories, understanding the recent looks from the runways

Total: 45 Hours

Reference(s)

1. Coco Rocha study of pose: 1000 pose, Coco Rocha, harper design 2014
2. Alicia Kennedy, Emily stoehrer, Jay calderin, Fashion design referenced, Rockport publishers, 2013.
3. Frank Doorhof, Mastering the Photoshoot, Peachpitpress, 2013
4. Beverly Massachusetts, Fashion details 1000 ideas from neckline to waistline, pockets to pleats, Mao, 2011.
5. Chris gatcum, Light and shoot: 50 fashion photos, Illex, 2011.
6. Nishantbaxi, Farout fashion, NKBs publishing, 2015

18FT005 INTIMATE FASHION 3 0 0 3

Course Objectives

- To elucidate the basics of human structure and measurements
- To develop knowledge about fabric selection and styles for intimate apparels.
- To impart technical knowledge about fabric properties that deals with the functional aspect of intimate apparels

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Course Outcomes (COs)

1. Compare the different sizing systems of brassieres and identify the differences between them.
2. Create basic block patterns for Brassieres.
3. Differentiate the types of girdles and analyze fabric properties role in girdle design
4. Analyze girdle pressure sensing systems and factors affecting girdle pressure
5. Determine the functional requirements of knitted and seamless apparels.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	1												
2	3	2	1											
3	2	1												
4	3	2												
5	3	2	2											

UNIT I **9 Hours**

BREAST MEASUREMENT AND SIZING

Breast measurement and sizing- measurement of breast dimensions-Control of posture and clothing-Body landmarks-Manual measurements-2D measurements. Latest technologies for breast measurements, breast sizing systems.

UNIT II **9 Hours**

BRA PATTERN TECHNOLOGY

Bra pattern technology - introduction -Basic block of bra pattern -Direct drafting of flat pattern - Direct drafting of soft bra - Direct drafting of wired bra-Direct drafting of push-up bra-Tracing from the sample-Three-dimensional modeling on the mannequin. Computerised 3D Intimate Pattern Design.

UNIT III **9 Hours**

INNOVATIONS OF GIRDLES

Historical development of girdles - classification of modern girdles - innovations of shape-up girdles-inventions of health promoting girdles -new materials for girdles - considerations of fabric properties in girdle design.

UNIT IV **9 Hours**

PRESSURE EVALUATION OF BODY SHAPERS

Physiological effects resulting from clothing pressure - Studies using direct pressure sensing systems - Indirect pressure prediction -Factors affecting girdle pressure absorption. Intimate apparel with special functions - Sports Bra -Pantyhose - Swimwear - Mastectomy Bras - Maternity Underwear.

UNIT V **9 Hours**

KNITTED AND SEAMLESS INTIMATE APPAREL

Functional requirements of knitted underwear -Engineering of knitted underwear fabrics - Performance evaluation of knitted underwear - Properties of commercial knitted underwear fabrics. Process innovation in seamless intimate apparel -Lamination - Moulding - Seamless knitting technology. Intimate apparels for men.

Total: 45 Hours

Reference(s)

1. W YuandJ Fan, Innovation and Technology of Women's Intimate Apparel, Woodhead Publishing Limited, England, 2014.
2. Lynn Nottage,Intimate Apparel, Nick Hern Books,USA,2014
3. Lynn Nottage,Intimate Apparel Dramatists Play Service, Incorporated,USA,2005
4. Marry Mathew, Practical Clothing Construction Part I, Basic Sewing Process, Cosmic Press, Chennai, 1999.
5. Stokes Terry, Intimate Apparel,Brooklyn Release Press, USA,1980.
6. http://www.enotes.com/topics/intimate-apparel

18FT006 FASHION ACCESSORIES 3 0 0 3

Course Objectives

- Improve the skill of fashion art and aspects of textile and non-textile rendering.
- Acquire knowledge on fashion accessories and their uses in enhancing the personality of the wearer.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Create three dimensional sketching for the fashion accessory designs.
2. Evaluate the design and performances of garment trims and accessories.
3. Design wearable accessories and evaluate the performances.
4. Upon the completion of the course, the students will be able to design carried accessories and evaluate the performances.
5. Upon the completion of the course, the students will be able to design and construct leather accessories

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2												3	
2	3		1										1	
3	3		1										2	
4	2		2										3	
5	3	2	2										3	2

UNIT I **9 Hours**

UNIT 1 FASHION ACCESSORIES AND SKETCHING

Fashion Accessories: Definition and importance of accessories in fashion, classification, accessory design. Classification of trims and accessories. Sketching: Basics of dry media and wet media, Papers. Sketching of basic shapes, the concept of three- dimensional sketching. Rendering of textures Leather, satin, woven fabric, fur, lace, sequins, precious stones. Sketching and rendering of fashion accessories.

UNIT II **9 Hours**

UNIT 2 GARMENT TRIMS AND ACCESSORIES

Selection of materials, design, performances and testing method for: Primary Trims / Accessories Lining, Interlining fusible and non-fusible, Embroidery backing, wadding materials. Secondary Trims / Accessories Closures (Buttons, Zippers, Snap fasteners, Hooks and Eyes, Hook and loop tape (Velcro), Eyelets), Shoulder pads, Ribbons, Braids, Laces, Appliques, Tassels.

UNIT III **9 Hours**

UNIT 3 WORN ACCESSORIES

Selection of materials, design, Performances Head and Hair accessories, Wigs, Sunglass, Mask, Neck Ties, Bows, Waist Bands, Wrist Bands, Wrist watches. Precious stones Types of stone settings. Selection of materials and design - Jewel - Ear rings, Necklaces, Pendants, Bracelets, Bangles, Rings.

UNIT V **9 Hours**

UNIT 5 LEATHER ACCESSORIES

Leather Processes, Type of cuts, Care and maintenance. Designing, Basic machinery/Equipment used, Size chart, Construction and Performances- Footwear, Belts, Gloves, Hand bags, Hats, Wallets, and other personal leather goods.

Total: 36 Hours

Reference(s)

1. Steven Thomas Miller, Drawing fashion accessories, Laurence King Publishing Ltd, 2012 Edition.
2. Phyllis Tortora, Encyclopedia of Fashion Accessories, OmBooksInternational, NewDelhi, 2003.
3. Harold Carr and Barbara Latham- Technology of Clothing Manufacture-Blackwell Science Inc. USA.
4. Stacy LoAlbo, Vintage Fashion Accessories, Krause Publications, China,2009
5. Ritu Bhargav, Design Ideas and Accessories, Om Books International,2004.
6. Patty Brown and Janett Rice, Ready To Wear Apparel Analysis, Prentice Hall, New Delhi, 2000.

18FT007 TREND ANALYSIS AND FORECASTING 3 0 0 3

Course Objectives

- Enable students conduct fashion scans and surveys
- Impart the knowledge of formulating trend capsules
- Enable students create color palettes

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
f. f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Analyse the characteristics of zeitgeist and appraise the fashion trends.
2. Apply the fundamental concepts of fashion forecasting process and formulate research strategies for organizing fashion scans
3. Apply the color story creation process and examine its validating criteria for establishing the color categories.
4. Analyse the characteristics of color cycles and resolve the factors affecting sales forecasting.
5. Apply the trend board preparation techniques and critique the trend reporting process.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2
3	3	2		2									3	3
4	3	2											2	2
5	3	2											2	

UNIT I **9 Hours**

ZEITGEIST

Discovering Zeitgeist, fashion scans, media scans, fashion trends, Consumer segmentation - values, attitudes and Lifestyle (VALS), Fashion culture and direction of fashion change

UNIT II **9 Hours**

FORECASTING PROCESS

Long term forecasting process and Short term forecasting process, Trend spotting, Study of Factors affecting forecasting process, Research strategies for Media scan, Interviewing focus groups, Observation of consumer behavior patterns, shopping profiles

UNIT III **9 Hours**

COLOR STORY DEVELOPMENT

Color story creation process, Sources of inspiration. Color story project steps, factors affecting color palette creation, relevance of patterns and graphics in emphasizing color story, Color validation process, Category prototyping, Analysis of current trends. Spotting new color contrast families.

UNIT IV **9 Hours**

COLOR CYCLES

Color cycles, Color relationship areas across product categories, Color groups, Sources of color ideas and palettes. Product life cycle, fashion cycle FAD, Classic. Factors affecting sales forecasting process - exogenous variables, Aggregation and Seasonality. Framework of using colors in color story.

UNIT V **9 Hours**

TREND REPORTING

Trend reporting - Trend labeling, Trend mapping and Trend Quality. Potential of a Trend. Characteristics of Trend board, Ways of creating focal points in trend board. Classical patterns of arrangement of images and text on trend board

Total: 45 Hours

Reference(s)

1. Lorynn Divita, Fashion Forecasting, Fairchild, 2019.
2. Chelsea Roussso and Nancy Kaplan Ostroff, Fashion Forward, Fairchild, 2018
3. Evelyn L. Brannon & Lorynn R. Divita, Fashion forecasting, Fairchild books, 2015
4. Eundeok kim & Ann marie fiore, Fashion Trends: Analysis and Forecasting, Berg publications, 2011
5. Tracy Diane and Tom Cassidy, Color forecasting, John wiley and sons, 2009
6. Https://www.vogue.com.

18FT008 FASHION PHOTOGRAPHY 3 0 0 3

Course Objectives

- To understand the fashion photography concepts
- To utilize the conceptual knowledge while shooting images
- To plan and compute the presentation of images shot

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
d. d. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyze the fashion photography concepts and its significance
2. Compare the methods of photography techniques followed in shooting images
3. Differentiate the lighting techniques used to capture images in varied perspectives
4. Analyze the equipment handling concepts followed in achieving quality images
5. Determine the editing parameters to produce a conceptual presentation of images

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3											-	-
2	2	3						1					-	-
3	3	2											-	-
4	1	2		3									-	-
5		1			3			2					-	-

UNIT I **9 Hours**

INTRODUCTION TO PHOTOGRPAHY

Overview of fashion photography Ã¢?? scope and opportunities, Types of cameras and lens specifications,

Different light sources comparative study, Studio shoot and outdoor shoot - lights and effects, Aperture and shutter speed relations, over and under exposures in shooting techniques.

UNIT II **9 Hours**

AESTHETICS OF PHOTOGRPAHY

Differentiation in the styling magazine, catalogues, websites and look book, bespoke showcases, Make up and looks, Understanding human body and fashion figures shape and silhouette, Design aesthetics clothing and accessories, Choosing of backgrounds and posing ordinary and bizarre.

UNIT III **9 Hours**

LIGHTING AND ITS EFECTS

Different lightings for portraits, groups, nudes and still life, Creative and glamour lighting, Studio lights and Outdoor lights effects and shooting techniques, Exploring the light and angle light and shadow, angle of view, Design principles and colours balance, composition and line, position and scale, perspectives and framing.

UNIT IV **9 Hours**

EQUIPMENTS AND DARK ROOM TECHNIQUES

Dark room techniques features and uses, Conventional and unconventional methods diffusion, sabattier effect, texturing, toning process consists of the following baths: bleaching, rinse, toning, hardening and final rinsing.

UNIT V **9 Hours**

EDITING METHODS

Post processing significance, Image manipulation flattening out the image in raw, blend transitions, colour balancing , Shaping the light brighter and darker exposure, black and white layer changing, Labelling of images descriptive writing, content enhancement.

Total: 45 Hours

Reference(s)

1. The incomplete highsnobiety guide to street fashion and culture, 2018, Gestalten.
2. Henry Carroll, Read this if you want to take great photographs, 2014.
3. Tom Ang, Photography the definitive visual history. 2014.
4. Steve Mccurry, The iconic photographs, 2012, Phaidon publishers.
5. Bruce smith, Fashion Photography: A Complete Guide to the Tools and Techniques of the Trade. 2008.
6. https://www.nytimes.com/1981/11/29/arts/camera-darkroom-techniques-for-more-interesting-prints.html

18FT009 PSYCHOLOGY OF COLOR 3 0 0 3

Course Objectives

- Acquaint the students with the concept of color perception and psychological aspects of colors.
- Acquire knowledge on effects of colors based on its usage on space.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyse the history, characteristics, effects and etymological origin of each hues.
2. Evaluate the psychological color perception, color blindness and transmittance of color.
3. Apply and create designs based on Gestalt psychology -laws and principles.
4. Design the home and store interiors by considering the socio economic aspects of color.
5. Apply the painting technique in works based on nature and art.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3											2	1
2	2	3						1					2	1
3	3	2											2	2
4	1	2		3									2	2
5		1			3			2					2	2

UNIT I **9 Hours**

COLOR PSYCHOLOGY AND COLOR SENSE

Colour psychology-Introduction, Characteristics and effects of major hues. Etymology of major hues- Stylistic and cultural origins. Colour theories History of color theories, Additive and subtractive color theories. Warm colours and cool colours - symbolisms

UNIT III **9 Hours**

COLOR AND PSYCHOANALYSIS

Gestalt psychology Introduction, principles. Colour preferences - age related preference, gender preference and cultural preference. Colour impression food and flavor, sport performances.

UNIT IV **9 Hours**

COLOR SPACE AND BRANDS

Colour function and cognitions Living room, Bed room, Bath room, Kitchen, Dining room and Work room. Usage of colours in store displays, branding and advertising.

UNIT V **9 Hours**

COLOR NATURE AND ART

The hues of plants, flowers, hairs of animals, feathers of birds and insects. Colours in nature representation of sunlight, sky at night time, ocean and mountain.Usage of colours in painting.

Total: 36 Hours

Reference(s)

1. M L Gulrajani, Colour measurement: Principles, advances and industrial applications, Nov 2010
2. Hylda Rhodes and Henri M. Leon, The Psychology and Tradition of Colour, Kessinger Publishing, LLC,2005.
3. Leatrice Eisenman, Colour: Messages & Meanings: A Pantone Colour Resource, Hand Books Press USA,2006.
4. Frank H. Mahnke, Colour, Environment, & Human Response, Wiley, Singapore, 1996.
5. Steven Bleicher, Contemporary Colour Theory and Use, Steven Bleicher Publishing, 2004
6. https://www.99designs.com

18FT010 INTERIOR DESIGN 3 0 0 3

Course Objectives

- To impart knowledge on interior design
- To improve the design skills, sustainable with socially-conscious designs

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
f. f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Analyse the elements of interior design concepts and resolve the personality requirements.
2. Create graphical representations of interior design concepts
3. Resolve the space planning requirements of residential home and retail centers as per CPWD guidelines
4. Determine the aesthetic requirements of interior design components
5. Analyse the roles and responsibilities of interior designer

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	3		1								2	
2	3	2	3		2	3		2					3	
3	3	3	3		2	2		2					2	
4	3	3	3		2	3		2					2	
5	3	2			2			3					3	

UNIT I **9 Hours**

INTRODUCTION

Interior designing - definition, importance, requirements and types - Structural design, Decorative Design - Designing interiors, Good taste; Design themes, types and application. Personality of the Home - Art elements - Line: types, characteristics and importance; form: size and shape, characteristics; Colour - sources, qualities, emotional effects, colour wheel and schemes.

UNIT II **9 Hours**

GRAPHICAL REPRESENTATIONS

3D compostion; Isometric and Axonometric- Still life- Furniture Sketching- Object Drawing with color rendering - Interior elements, Lighting, plants. Perspective, Axonometric Isometric drawing. Orthographic Projection - Lifts and escalators.

UNIT III **9 Hours**

SPACE PLANNING AND ACOUSTICS

Acoustics and their application in interiors, water proofing, fire safety. Space planning concepts - interiors, circulation. Residential house space planning case study, Retail centers space planning Ã¢?? CPWD guidelines

UNIT IV **9 Hours**

INTERIOR COMPONENTS

Application of colour in interiors; Texture - types and significance; Pattern: types and effects; Light - importance. Importance of Furniture Design for Interiors- Ancient Age / Middle Age / Contemporary. Doors, Windows, Staircase designs, False Ceiling, Partitions, Wall Paneling, Comics, Mosaic, Cladding- Flooring and Wall Cladding

UNIT V **9 Hours**

ROLES AND RESPONISBILITIES OF INTERIOR DESIGNER

Role of an Interior Designer- Responsibility towards society and need of an Interior Designer to better the environment- Ethics and Code of Conduct- Responsibility towards client, contractor and supplier, Estimation. Professional Fees- Work of an Interior Designer- Making of portfolio, JD Annual Design Awards.

Total: 45 Hours

Reference(s)

1. Joanna Gaines, Homebody: A guide to creating spaces you never want to leave, Harper design, 2018.
2. Erin gates, Elements of Style: Designing a Home and a life, Simon and Schuster, 2014.
3. Simon Dodsworth, The Fundamentals of Interior Design, AVA publishing, 2009.
4. V. Mary. Knackstedt, The Interior Design Business Handbook: A Complete Guide to Profitability, Wiley, New Jersey; 2006

5. M. G. Shah, C. M. Kale, and S.Y. Patki, Building Drawing with an Integrated Approach to Build Environment, Tata McGraw Hill, 2002.
6. Https://eclectictrensds.com

18FT011 FASHION CRAFTS 3 0 0 3

Course Objectives

- To impart theoretical and practical knowledge about various handi-craft techniques.
- To enhance innovative skills on hand crafts.
- To build confidence on doing handicrafts.

Programme Outcomes (POs)

c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
g. g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
l. l. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyse the basic requirements for making craft products
2. Generate Eco friendly craft products from paper and clay.
3. Apply the craft techniques and make jewelry products
4. Apply the craft techniques and make Leather products
5. Apply the knowledge of traditional crafts

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	-											
2	3	2	2										2	1
3	3	2	2										2	1
4	3	2	-										2	1
5	3	2	-											

UNIT I **9 Hours**

INTRODUCTION TO FASHION CRAFTS

Definition of Handicraft, Classification-Reusable, Non reusable. Raw materials used for making craft products.

Criteria for raw materials selection. Techniques and tips in making fashion crafts.

UNIT II **9 Hours**

FASHION CRAFTS -PAPER AND CLAY

Paper-tissue paper flowers, frames, gift tags, note pad, gift bags gift boxes, bookmarks. paper beads. Clay- Air dry, Metals, polymer. Sustainable clay products.

UNIT III **9 Hours**

FASHION CRAFTS -JEWELLERY

Jewelry making-Anklets, Beading, Bracelets, Earrings, Pendants, Necklaces, Rings, wire jewelry. Quality aspects- jewelry quality assurance standards

UNIT IV **9 Hours**

FASHION CRAFTS- LEATHER

Leather-Key chains, clutch, wallet, phone case, pen holder, plant pot holder, origami envelope. Quality aspects- Environmental aspects of leather products manufacturing, Acceptable quality standards in leather industry.

UNIT V **9 Hours**

TRADTIONAL CRAFTS

Traditional crafts -definition and its specialties at different regions. Traditional crafts of TamilNadu-Famous paintings of tanjore, musical instruments, metal ware, pottery, woodcraft, stone carvings, and paper mache.

Total: 45 Hours

Reference(s)

1. Handmade in India: A Geographic Encyclopaedia of India Handicrafts. Abbeville press; 1 edition (October 20,2009)
2. Encyclopaedia of Card making Techniques (Crafts), Search Press Ltd, illustrated edition, 2007
3. All about Techniques in Illustration, Barrons Educational Series, 2001
4. Printing by Hand: A Modern Guide to printing with Handmade stamps, Stencils and Silk Screens, STC Craft/A Melanie Falick Book, 2008
5. Materials & Techniques in the Decorative Arts: An Illustrated Dictionary, University of Chicago Press, 2000
6. www.fashioncraft.com

18FT012 ADVANCED PATTERN ENGINEERING 3 0 0 3

Course Objectives

- To impart knowledge on advancement in the Pattern Engineering.
- To explore unconventional techniques in the field of designing.
- To fabricate patterns of different styles using draping method.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Apply draping techniques and develop new silhouettes.
2. Apply contouring techniques and resolve fitting problems.
3. Create patterns for layered garments and model new designs.
4. Create patterns for stretch garments and model new designs
5. Compute patterns using subtraction cutting techniques and develop various garment styles.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	2										2	1
2	3	2	2										2	2
3	3	3	2										2	3
4	3	3	2										2	4
5	3	2	2										2	5

UNIT I **9 Hours**

DRAPING

Introduction, Equipments, Basic patterns - Front, Back, Skirt and Sleeves - Preparation of Muslin for draping, Draping steps, Marking, Trueing, Bodices - Front Bodice with underarm Dart, Back Bodice with neckline dart, Dart variations, Pleats, Dart tucks and Gathers, The Halter, Variations of basic skirt - One piece, Tapered, Eased, Dome, Gored and Flared skirts, Basic straight trousers and Collar draping.

UNIT II **9 Hours**

CONTOURING

Principle, Contour designs, Figure versus basic garment, Fitting problems, The contour Guide patterns - Preparing the guide patterns, Measure depth of hollow areas and chart the patterns, Guidelines for cutout neckline, cutout armhole, armhole ease, empire style line, contour between the busts, strapless designs, shoulder slope and side ease, The classic Empire, Surplice (or wrap) designs, Off-shoulder Designs, Halters - V-neck halter.

UNIT III **9 Hours**

JACKETS AND COATS

Basic Jacket and coat Foundations, Two Jacket Foundations, Terms and definitions, The Jacket and coat sleeves - Cap Ease, Grading the Jacket/Coat sleeves, tailored two piece sleeve, Collar/Lapel Designs - Basic notch

collar/lapel, Low-notch lapel, Portrait collar and lapel, Double-Breasted Jacket, Design variations, Shawl Foundations - collar variations, wide shawl collar, shawl collars with separated under collar and facing, Mannish Jacket foundation.

UNIT IV **9 Hours**

PATTERN MAKING FOR STRETCH FABRICS

Stretch terms - Objectives, Direction of stretch, Stretch factor, Stretch ratio, Stretch fits, Pattern making terms - Slopers, Grain, Cross grain, Grain line, Notches, Stays, Bias, Types of Fit - Tight, Loose, Semi-fit, over-sized, Sizing and measurements, Principles of Pattern drafting, Slopers and reductions, Draft - Skirts, Sleeves, Tops.

UNIT V **9 Hours**

UNCONVENTIONAL TECHNIQUES

Subtraction Cutting - Definition, three techniques of subtraction cutting, Basic things necessary for cutting, The Tunnel technique, Coil method, The Plug technique, Glove dress, Square-spiral dress, interface-spiral dress, Displacement Technique, Preparation of subtraction tunnel ready to make a dress

FOR FURTHER READING

Introduction, Computer aided garment designing, Comparison of existent 3D designing system, Possibilities of acquiring anthropometrical data, Limitations of human body 3D scanning, virtual environment and virtual reality, applications.

Total: 45 Hours

Reference(s)

1. Helen Joseph Armstrong, Pattern Making for Fashion Designers 5th Edition, Prentice-Hall, New Jersey, 2010.
2. Winifred Aldrich, Pattern Cutting for Menswear, 4th edition, Blackwell Science Publisher, USA, 2006.
3. Hilde Jaffe Nurie Relis, Draping for Fashion Design 4th Edition, Dorling Kindersley India Pvt. Ltd, 2009
4. Mary Mathew, Practical Clothing Construction, Part-II, Designing Drafting and Tailoring, Cosmic Press, Chennai, 1999.
5. Winifred Aldrich, Metric Pattern Cutting, Om Book Service, 1997
6. Kapoor Bela, Pattern Drafting and Making, Phoenix Publishing House Pvt. Ltd., 1997

18FT013 PLANT LAYOUT AND FACILITES DESIGN 3 0 0 3

Course Objectives

- To understand the material management and their movement in the production.
- To implement the concepts of production planning and control in the form of plant layout.
- To utilize the various techniques in production planning and control.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

d. d. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Course Outcomes (COs)

1. Analyse the plant layout objectives and organize the elements of facilities planning.
2. Design and develop effective layouts according to the process methods and techniques followed in the apparel industry.
3. Evaluate the appropriate site selection methods and optimize the site selection parameters.
4. Evaluate appropriate process methods and techniques to minimize the cost of production.
5. Create the skill of line balancing according to the need of apparel industry.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	3												
2	1	2	3											
3		3	2											
4	2	3	1											
5	1	2	3											

UNIT I **9 Hours**

INTRODUCTION

Plant Layout- Objectives, Principles of Plant layout, Classification of layout - Process layout, Product layout, Combination layout, fixed position layout, Group layouts and its advantages and disadvantages, Elements of facility planning, Levels of facility planning, Advantages of facility planning. Factors considered while choosing plant layout.

UNIT II **9 Hours**

DESIGNING THE LAYOUT

Design of Product layout - Assembly lines, Line balancing, Behavioral factors, No. of models produced, Cycle times, Design of process layout - Procedure, Flow matrix, Flow-cost matrix, Proximity chart, Design of Service layout, Flow matrix and Design of product layout.

UNIT III **9 Hours**

PLANT LOCATION AND LAYOUT

Introduction, Need for selecting suitable location - In case of New factory set up, In case of existing factory location, In case of Global set up, Reasons for Global/Foreign Location, Factors Influencing Plant location/ Factory Location, Specific Locational factors - for manufacturing organization, Service organization, Location theories, Location Models

UNIT IV **9 Hours**

ORGANIZATION OF PHYSICAL FACILITIES

Factory Building - Design of the building, Types of Building - Single storage & Multi-storage buildings, Lighting - Control of Lighting, Climatic conditions - Working in Hot and cold environment, Thermal environment, Ventilation, Work related welfare activities - Drinking water, Sanitary facilities, First Aid and Medical facilities, Rest, Feeding, Child care and Recreational Facilities.

UNIT V **9 Hours**

PLANT LAYOUT AND MATERIAL HANDLING TECHNIQUES

Material Handling - Objectives, Principles of Material Handling, Selection of Material Handling Equipment, types, Evaluation of Material Handling system, Material Handling equipment - Fixed path and Variable path equipment - Conveyors, Industrial Trucks, Cranes and Hoists, Containers, Robots, Relationship between Plant Layout and Material Handling .

Total: 45 Hours

Reference(s)

1. Jack Greene, Plant Design, Facility Layout and Floor Planning, second edition, Create Space Independent Publishing Platform, 2013
2. S Anil Kumar and S Suresh, Production and Operation Management, second edition, New Age Publications, 2009
3. Richard L.Francis, Facility layout and location: An analytical approach, second edition, Prentice hall India learning private limited, 1998
4. James M. Moore , Plant Layout and Design , Collier Macmillan Publisher, 1962
5. https://www.wisdomjobs.com/e-university/production-and-operations-management-tutorial-295/historical-evolution-of-production-and-operations-management-9434.html
6. http://www.inc.com/encyclopedia/facility-layout-and-design.html

18FT014 QUALITY CONTROL OF GARMENTS AND ACCESSORIES

3 0 0 3

Course Objectives

- To understand the material management and their movement in the production.
- To implement the concepts of production planning and control in the form of plant layout.
- To utilize the various techniques in production planning and control

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Course Outcomes (COs)

1. Design and develop quality assurance systems for screening the apparel quality.
2. Evaluate the quality standards required for performing garment package test
3. Apply appropriate sampling technique for determine the apparel quality
4. Evaluate appropriate process methods and techniques to minimize the defects generated in manufacturing.
5. Evaluate appropriate testing methods for accessories used in apparel products

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	2											
2	3	2	2											
3	3	2												
4	3	2	2											
5	3	2	2											

UNIT I **9 Hours**

INTRODUCTION

What is quality, Importance of quality, Difference between quality assurance and quality control,. Inspection - types of inspection, Raw material inspection techniques -4 point system, 10 point system, Graniteville system, in process inspection - acceptance sampling plan, skip bundle inspection techniques, final inspection - spot checking, statistical sampling

UNIT II **9 Hours**

QUALITY PERFORMANCE STANDARDS

Different apparel product performance standards - Seam strength, Dimensional stability, Button pulling strength, Spirality, Color fastness, Wash fastness, Perspiration fastness, light fastness, Pilling resistance,

Abrasion resistance.

UNIT III **9 Hours**

SAMPLING AND QUALITY CONTROL TOOLS

Sampling, types of sampling, Quality control tools - Cause and effect diagram, control chart, flow chart, histogram, Pareto chart and Scatter diagram

UNIT IV **9 Hours**

SPECIFICATION AND PROCESS DEFECTS

Raw material specifications - woven garments and knitted garments, Buyer manual specifications for constructions. Pattern grading defects, Marker defects, Spreading and laying defects, Cutting defects, Seam defects, Stitching defects and mistakes, Finishing defects

UNIT V **9 Hours**

ACCESSORIES QUALITY

Quality control of trims: sewing threads, zippers, interlinings, and buttons. Label; types: care labels, brand labels and size label. Quality and importance of labeling. Quality costs Ã¢?? Cost of Conformance, cost of non conformance.

FOR FURTHER READING

Quality management systems, Lean approach

Total: 45 Hours

Reference(s)

1. Stanley Bernard Brahams ,The Fundamentals of Quality Assurance in the Textile Industry, 1 st edition CRC Press Taylor and fancies group, New York, 2016.
2. S Anil Kumar and S Suresh, Production and Operation Management, second edition, New Age Publications, 2009
3. Jack Greene, Plant Design, Facility Layout and Floor Planning, second edition, CreateSpace Independent Publishing Platform, 2013
4. James M. Moore , Plant Layout and Design, Collier Macmillan Publisher, 1962
5. http://www.inc.com/encyclopedia/facility-layout-and-design.html
6. http://ecoursesonline.iasri.res.in/mod/page/view.php?id=1134

18FT015 FASHION BRAND MANAGEMENT 3 0 0 3

Course Objectives

- To understand the importance of brands
- To gain an insight into various brand management activities.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and

safety, and the cultural, societal, and environmental considerations.
d. d. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
k. k. Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to oneÃ¢??s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Apply knowledge about measuring the brand management control functions.
2. Analyze the brand equity parameters and use them to suit the requirement.
3. Evaluate the market scenario requirements and formulate strategies for positioning the brand.
4. Determine the marketing and distribution functions for a particular brand position.
5. Evaluate the needs for brand extension.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3		1									-	-
2	-	3						1					2	-
3	-	2		3				1					-	-
4	-	-	3	2				1					3	-
5	-	1						2			3		-	-

UNIT I **9 Hours**

OVERVIEW OF BRAND MANAGEMENT

Significance of branding -brand defined -Difference between a Product and a Brand - rationale for building a brand - types of brands - Branding Challenges -Creating a brand - Strategic planning for the brand -Designing brand Identity -Measuring brand personality - Brand Image - Luxury Brands- Organizational culture and brand performance -Brand Mantras and Internal branding for a successful brand - Case study

UNIT II **9 Hours**

UNDERSTANDING AND MEASURING BRAND EQUITY

Introduction - What is brand equity - Brand equity defined - Need for building brand equity -Steps in building a Brand -Researching for brand equity -Tracking a brand -The brand chain - Research techniques -Quantitative research techniques applied to branding - Measuring brand equity -Need for measuring brand equity -Methods to measure brand equity -Case Study

UNIT III **9 Hours**

UNDERSTANDING CONSUMERS AND MAKETS

Consumer behavior and the role of branding - concept of perception- brand evaluation and perception by customers -Consumer attitude -the Indian Consumer - Model of consumer decision making - Factors affecting consumer behavior - Brand loyalty and Brand commitment - Factors affecting brand loyalty - Concept of brand positioning - Positioning defined -Positioning strategy - Guiding principles for positioning -Repositioning- Case Study

UNIT IV **9 Hours**

MANAGING BRANDS

Branding and the marketing programme - Product Strategy -Pricing Strategy -Distribution Strategy - E-branding : Building the brand online -E-business strategy -Marketing and the internet - Branding and marketing communications -Communication options : Personal selling, sales promotions, Events and compaign marketing , Direct Marketing, Publicity and PR, Word of mouth, Internet marketing - Case Study

UNIT V **9 Hours**

BUILDING RESILIENT BRANDS

Defining branding strategy -Strategies for choosing a brand name -Line extension Category Extension - Brand Sketching - Launching a brand extension - Managing brand architecture - Brand roles in the brand portfolio - Brand relationship spectrum -Managing Brands over time - Brand challenges - Reinforcing brands - Brand revitalization -Brand turnaround -Case Study

Total: 45 Hours

Reference(s)

1. David A. Aaker, Managing Brand Equity, Simon and Schuster, 2009.
2. Kirti Dutta , brand management principles and practices-2012, Oxford University Press
3. Kevin Lane Keller, Strategic Brand Management: Building, Measuring and Managing, Prentice Hall, 3rd Edition, 2007.
4. Moorthi YLR, Brand Management I edition, Vikas Publishing House 2012
5. Lan Batey, Asain Branding A Great way to fly, PHI, Singapore, 2002.
6. Paul Tmepoal, Branding in Asia, John Willy, 2000.

18FT016 INTERNATIONAL BUSINESS IN APPAREL INDUSTRY

3 0 0 3

Course Objectives

- 1.To familiarize the students to the basic concepts of international business management
- 2.To Understand the social, cultural and economic factors that lead to trade between countries
- 3.To know the Legal processes involved in imports and exports

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
k. k. Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyse the global business environment, global strategic management practices and get acquainted with functional domain practices.
2. Check the different types of trade practices and concepts in international business.
3. Apply knowledge of financial protocols associated with business practices and developworking models.
4. Create strategies for International organization management and human resource development
5. Evaluate the supply chain requirements for organizing the international business operations

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	1											1	
2	2	2												
3	1	1									2			
4	1	1			1									1
5	1	1												

UNIT I **9 Hours**

CONCEPT OF INTERNATIONAL BUSINESS

Meaning and importance of international business - Domestic business versus International business - Multinational Corporation - Modes of International business -Trade Mode -Direct and Indirect Export - Contractual Entry Modes- Licensing -Franchising- Turnkey Projects- Management Projects - Foreign Investments - Strategic Alliance

UNIT II **9 Hours**

REGULATION OF TRADE AND INVESTMENT AT THE INTERNATIONAL LEVEL

Basic Principles of multilateral trade negotiations - GATT and its early rounds -Uruguay Round - World Trade Organization (WTO) - Basic difference between GATT and WTO - Structure of WTO - Functions of WTO - Settlement of Disputes - WTO and India -UNCTAD - Origin of UNTCAD -Major Areas of Negotiations - Free Trade Agreement (FTA) -Recent Developments

UNIT III **9 Hours**

INTERNATIONAL FINANCIAL ENVIRONMENT

International Monetary System -Gold Standard (early system) -Bretton Woods System of Exchange Rates - Exchange Regime Since 1973- Exchange rate quotation - Direct and Indirect Quotes -Buying and selling rates - Forward rates - Cross rates - Factors influencing exchange rate -International Financial Market - World Bank - Euro Banks

UNIT IV **9 Hours**

ORGANISATIONAL STRUCTURE OF INTERNATIONAL BUSINESS

Organizational Structure -Traditional organizational Structure - Functional Structure -Product Structure - Creation of Export Department - International Division - Global Division - Global Product Structure - Global Area Structure -Global Functional Structure -Multidimensional/ Matrix Structure -Some other Structures - Coordination among Sub- Units

UNIT V **9 Hours**

MANAGEMENT OF INTERNATIONAL OPERATIONS

Location for production- Factors behind selection of Location -Selecting a location Management of Inventory - deviation from EOQ-Shifting of Re-order Point - Just-in-time System - Sourcing of Inputs -Modes of procurement - Make or Buy Decision -International Logistics -Transportation Issue - Packaging of Products - Storage Facility - International services

Total: 45 Hours

Reference(s)

1. Vyuptakesh Sharan, International Business - Concepts, Environment an Strategy, 3rd Edition, Pearson Education in South Asia, New Delhi, 2011.
2. Darlie O. Koshy, Garment Exports: Winning Strategies, Prentice-Hall of India, 2006.
3. Charles W.I. Hill and Arun Kumar Jain, International Business, 6th edition, Tata Mc Graw Hill, New Delhi, 2010.
4. John D. Daniels and Lee H. Radebaugh, International Business, Pearson Education Asia, New Delhi, 2000.
5. K. Aswathappa, International Business, 5th Edition, Tata Mc Graw Hill, New Delhi, 2012.
6. Michael R. Czinkota, Ilkka A. Ronkainen and Michael H. Moffet, International Business, 7th Edition, Cengage Learning, New Delhi, 2010.

18FT017 SUPPLY CHAIN MANAGEMENT 3 0 0 3

Course Objectives

- To learn the individual processes of supply chain management and their interrelationships within individual companies and across the supply chain.
- An understanding of the management components of supply chain management.
- An understanding of the tools and techniques useful in implementing supply chain management.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Analyse the basic elements in supply chain management and its functions.

2. Plan and organize retail distribution logistic systems.
3. Evaluate order management and reverse logistics.
4. Evaluate the role of logistics drivers and contemporary practices.
5. Organize the functions of warehouse management.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	1												
2	2	2												
3	3	2												
4	1	2												
5	2	1												

UNIT I **9 Hours**

INTRODUCTION

Concepts of Supply Chain and Logistics - Elements of Supply Chain - Elements of Logistics -Manufacturing Supply Chain - Functions of Manufacturing Supply Chain - Retail Supply Chain - Functions of Retail Supply Chain -Scope of Retail Logistics - Retail Supply Chain Management as a subset of Retail Management -Retail supply chain elements.

UNIT II **9 Hours**

MANAGING RETAIL LOGISTICS

Retail Distribution - Retail Replenishment - Direct Store Delivery - Managing Retail Home Delivery - IT for Retail distribution and replenishment -Measures for Retail Distribution and replenishment - Retail logistics - Retail Transport -Transportation Cycle of a retailer - Using IT in Transport Management -Green Transport.

UNIT III **9 Hours**

ORDER MANAGEMENT AND REVERSE LOGISTICS

Order Management -Order Management Process - Concept of perfect order- Perfect order measures -Multi channel logistics -Retail Return and reverse logistics -Return Policy - Return Process -Reverse Logistics- Reverse logistics process -Designing reverse supply chain Network - Reverse Logistics Challenges -Application for Reverse Management.

UNIT IV **9 Hours**

RETAIL LOGISTICS AND CONTEMPORARY ISSUES

Managing retail shrinkage -Elements and causes of shrinkage - Approach for shrinkage reduction - Green retailing - Green Logistics -Green Infrastructure -Green IT - Managing Logistics Service Provider -3PLs/LSPs - Services outsourced to LSP/3PL -Major drivers of logistics outsourcing - Benefits of using 3PL/LSP -Evolution of 4 PL - Retail Logistic Service Provider - An Indian perspective.

UNIT V **9 Hours**

WAREHOUSE MANAGEMENT

Cross Docking -Advantages of cross docking - How cross docking works -Cross Docking Functions - Necessary ingredients for Cross Docking - How cross docking saves time -Warehouse Process Maturity Model -IT in warehouse Management - Measures of warehouse Management - Retail Warehousing -Basic Functions of

retail warehouse-Value added services of a Retail Warehouse.

Total: 45 Hours

Reference(s)

1. Rajesh Ray, Supply Chain Management for Retailing, Tata McGraw Hill Education Private Ltd, 2009.
2. Janat Shah, Supply Chain Management -Text and Cases, Pearson Education, 2009.
3. Sunil Chopra and Peter Meindl, Supply Chain Management-Strategy Planning and Operation, PHI Learning / Pearson Education, 2007.
4. Ballou Ronald H, Business Logistics and Supply Chain Management, Pearson Education, 5th Edition, 2007
5. David Simchi-Levi, Philip Kaminsky, Edith Simchi-Levi, Designing and Managing the Supply Chain: Concepts, Strategies, and Cases, Tata McGraw-Hill, 2005.
6. Altekar Rahul V, Supply Chain Management-Concept and Cases, PHI, 2005.

18FT018 HUMAN RESOURCE MANAGEMENT 3 0 0 3

Course Objectives

- To provide knowledge about management issues related to staffing, training, performance, compensation, human factors consideration and compliance with human resource requirements.
- To impart knowledge on personal resource and utilization.
- To know about the strategies for evaluating the performance of personnel.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Course Outcomes (COs)

1. Apply knowledge about the functions of human resources management.
2. Evaluate the recruitment practices and organize its planning processes.
3. Plan and organize the performance appraisal mechanisms.
4. Evaluate the job performance and organize the incentive schemes.
5. Demonstrate knowledge about the leadership theories.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2
3	3	2		2									3	3
4	3	2											2	2

5	3	2											2	

UNIT I **9 Hours**

INTRODUCTION

Human Resource Management (HRM)-Features of HRM - Objectives of HRM -Scope of HRM - Role of HRM-Functions of HRM - Limitations of HRM - Personnel Management -HRM & Personnel Management - Challenges to Personnel Management - Organization of Personnel Department- Personnel Department in line, functional and line & staff organization - Role of Personnel Manager.

UNIT II **9 Hours**

PROCUREMENT

Job Analysis -Need of Job Analysis -Steps in Job Analysis - Methods of data collection - Job Description - Job specification - Job design - Methods of job design - Human Resource Planning - Types of manpower planning - Recruitment - Process of recruitment - Sources of recruitment - Selection- Steps in selection process - tests and Interviews -Placement and Orientation -Transfer, Promotion and Separations

UNIT III **9 Hours**

DEVELOPMENT

Performance Appraisal (PA) - Objectives, benefits & Methods of PA -Essentials of Effective Appraisal System -Training and Development -Training Methods-Steps in systematic Training Plan - Executive Development - Methods of Executive Development - Career Planning and Development - Individual vs. organization career planning -Career Counseling

UNIT IV **9 Hours**

COMPENSATION

Job Evaluation - Difference between job evaluation and performance appraisal - Objectives and methods of Job Evaluation - Employee Remuneration - Remuneration Package - Wage and Salary administration -Methods of wage system - Wage Policy and various Acts -Pay Structure - Bonus - Incentives - types of incentive plans - Profit sharing - Non-financial incentives

UNIT V **9 Hours**

INTEGRATION

Morale - Morale vs. productivity -Building high morale -Absenteeism - Causes and effects of absenteeism - Labour turnover - Methods to calculate labour turnover - Causes and effect of labour turnover - Steps to control labour turnover - Motivation -Importance of motivation -Techniques to increase motivation - Theories of motivation (Maslow , Herzberg, theory X and theory Y and Vroom's expectancy theory).

Total: 45 Hours

Reference(s)

1. Vaishali K Shah, Human Resource Management, 2007, Global book publishing Company.
2. Dessler, Human Resource Management, Pearson Education Limited, 2007.
3. Decenzo and Robbins, Human Resource Management, Wiley, 8th Edition, 2007.
4. Luis R.Gomez-Mejia, David B.Balkin, Robert L Cardy. Managing Human Resource, PHI Learning. 2012.
5. Bernadin, Human Resource Management,Tata Mcgraw Hill ,8th edition 2012
6. Wayne Cascio, Managing Human Resource, McGraw Hill, 2007.

18FT019 PROJECT MANAGEMENT **3 0 0 3**

Course Objectives

- To learn the basics of managing projects.
- To understand the concepts related to project management.
- To get self-confidence to manage projects on his own

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
k. k. Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to oneÃ¢??s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
l. l. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Demonstrate knowledge about project management principles.
2. Plan and schedule phases required for project planning
3. Apply the tools for evaluating and executing projects.
4. Evaluate the progress of projects by applying appropriate tools.
5. Demonstrate knowledge on leadership skills in handling projects

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	1	-									1		
2	1	1	-							1				
3	2	2	-		1									1
4	1	2	-		2									
5	-	-	-						2	2	1			1

UNIT I **9 Hours**

PREPARING FOR PROJECT MANAGEMENT SUCCESS

Importance of Project Management -What is project Management - Characteristics of Project Work -Role of the project manager -Project Manager skills -Project Manager relationships and tools - Role of Team Members - Roles of clients, customers and other stakeholders - setting up a planning and control system (PCS) - Need for PCS - Elements and models of a PCS.

UNIT II **9 Hours**

PLANNING THE PROJECT

Defining the project -defining the problem or opportunity - Types of projects - Project objectives - Work breakdown structure - Estimating activities -Estimating methods - Precision of Estimates-Sequencing activities - Diagramming methods - Network diagram -Calculating the critical path - Preparing schedules - Gant chart - preparing resource plans and budget plans

UNIT III **9 Hours**

EXECUTING THE PROJECT -I

Initiating project -communicating project plans - controlling project objectives -Time control - Cost control-common causes of cost problems- Scope and Quality Control - Resource Control-Control thresholds - Tools to use in controlling project objectives -Inspection-Statistical sampling- Flow charting -Control Charts -Trend Analysis -Pareto Diagrams - Cause & Effect Diagram

UNIT IV **9 Hours**

EXECUTING THE PROJECT -II

Reporting on project objectives -Graphical reports -Reporting percent complete - Sample reports -Status report - Schedule baseline plan -Cost report - Controlling changes in the project -Conducting Project evaluations -types of project evaluations - Parameters for project evaluations - Managing Risk - major categories of risk - Assessing risk -Responding to risk - Closing the Project - Project closure checklist

UNIT V **9 Hours**

LEADING THE PROJECT TEAM

Developing project teams - Leadership environment -Stages of Team Development -Managing Conflict - Potential causes of conflict - Handling conflict -Communicating effectively -Process of communication - Barriers to communication - Holding Effective Meetings- Making Team Decisions - Using sources of power wisely -Managing Change - Managing performance.

Total: 45 Hours

Reference(s)

1. 1. Larry Richman, Project Management Step-by-Step, 2009, PHI Learning Private Ltd, Eastern Economy Edition
2. 2. Clifford Gray and Erik Larson, Project Management, Tata McGraw Hill Edition, 2005.
3. 3. John M. Nicholas, Project Management for Business and Technology - Principles and Practice, Second Edition, Pearson Education, 2006.
4. 4. Gido and Clements, Successful Project Management, Second Edition, Thomson Learning, 2003.
5. 5. Harvey Maylor, Project Management, Third Edition, Pearson Education, 2006.
6. 6. https://www.chandleraz.gov

18FT020 FASHION ENTREPRENEURSHIP **3 0 0 3**

Course Objectives

- To develop motivation and strengthen entrepreneurial urge in students.
- To impart basic entrepreneurial skills and understandings to run a fashion boutique/retail business efficiently and effectively

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
f. f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
g. g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
l. l. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyse knowledge of the competencies required for becoming an entrepreneur
2. Evaluate the requirements for starting a business.
3. Analyze project appraisal methods and financial planning activities.
4. Analyze fundamental concepts of business management functions.
5. Apply supporting services required for operating and running the business.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2
3	3	2		2									3	3
4	3	2											2	2
5	3	2											2	

UNIT I **9 Hours**

INTRODUCTION

Entrepreneurship-Definition, concept, importance & scope. Distinction between an Entrepreneur and a Manager, Characteristics, Functions and Types of Entrepreneur. Entrepreneurship Development Programs-Need and Objectives. Role of entrepreneurs in development of apparel and fashion industry, entrepreneurship with reference to fashion and apparel industry in India.

UNIT II **9 Hours**

BUSINESS PLAN

Entrepreneurship Development- Formulation of a Business plan. steps in setting up an enterprise- identifying, selecting a Good Business opportunity, Market Survey and Research, Techno Economic Feasibility Assessment, Preparation of Preliminary Project Reports, Project Appraisal, bank formalities, term loan, working capital, project financing. Location & plant layout-factors, influencing plant location, building, structure, lighting, ventilation. Project Planning and Scheduling.

UNIT III **9 Hours**

ENTREPRENEURSHIP IN APPAREL INDUSTRY

Apparel Business-Starting a new venture related to apparel industry, essentials of a successful centre, Formalities of opening a firm, the status of firm, Individual proprietor/partnership/ Pvt. limited company & public Ltd Company. Organizational structure of a garment unit-Hierarchical organization, production planning and control- material handling, availability of labour, material management and transportation. Challenges for fashion entrepreneurship.

UNIT IV **9 Hours**

INDUSTRIAL MANAGEMENT

Industrial sickness and remedies, tax planning, VAT, Patent Rules, Factory Act, Minimum wages, knowledge of exemptions & deductions, equipment Management. Inventory control- production control- quality control, cost control and business communication. Health and safety Measures in Textiles and garment industries. 6 M"s of Entrepreneurship.

UNIT V **9 Hours**

SUPPORT

Institutional Finance to Entrepreneurs -Commercial Banks -other Financial Institutions - IDBI, IFCI, ICICI, UTI, IRBI, LIC,SFCs, SIDCs, SIDBI, EXIM Bank, Lease Financing -Concept of lease - Types of Lease agreements - Concept of Hire Purchase -Difference between hire purchase and leasing -Procedure for Hire Purchase - Taxation benefits and Government Policy with reference to textile and fashion industry.

Total: 45 Hours

Reference(s)

1. Marketing: An Introduction (10th Edition).
2. Fashion entrepreneurship by Michel Granger
3. Fashion entrepreneurship by Sandara Burke, Burke publishing
4. S.S.Khanka "Entrepreneurial Development" S.Chand & Co. Ltd. Ram Nagar New Delhi, 1999.
5. Kuratko & Hodgetts,"Entrepreneurship-Theory, process and practices"Thomson learning 6th edition.

18FT021 INTERNATIONAL SOCIAL COMPLIANCE **3 0 0 3**

Course Objectives

- To educate about the various laws pertaining to suitable working conditions for labors
- To study the various welfare measures that are to be provided as per the international laws
- To gain knowledge about various standards pertaining to welfare of the personnel in the apparel industry

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Analyse the elements of social compliance requirements in apparel industries.
2. Demonstrate knowledge about the implementation of various welfare measures of apparel industry.
3. Attribute the compliance requirements necessary for industry certification.
4. Apply the social accountability certification systems in the apparel industry
5. Assess the ability to resolve labour policies pertaining to welfare of the personnel of the apparel industry

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	1						3	3	3				
2	2	1						2	3	3				
3	3	2						3	2	3				
4	3	3						3	3	3				
5	3	2						3	3	3				

UNIT I **9 Hours**

ELEMENTS OF SOCIAL COMPLAINCE

Child labour - Forced labour - Health and safety , Freedom of association , Collective bargaining, Rights to organise -Disciplinary practices, Discrimination, Working hours - Wages, Overtime, Compensation and Remuneration, Management systems -Environmental issues.

UNIT II **9 Hours**

WELLFARE MEASURES

ESI benefits - PF contribution - First aid, Disablement benefits - Rest rooms Ã che facility - Maternity benefits - Transport facilities.

UNIT III **9 Hours**

COMPLAINCE WITH ETHICAL CODES

International labour organization conventions- United Nations global compact -Ethical trading initiative base code -World-wide Responsible Apparel Production (WRAP) - Fair Labour Association - International Council of Toy Industries (ICTI) -Initiative clause society (ICS) -AVE sector model- Fair Trade Practices - CTPAT

UNIT IV **9 Hours**

SOCIAL ACCOUTNABILITY

SA8000 certification - Benefits of SA8000 - Food safety and certification - HACCP -Benefits of adopting HACCP Ã¢?? FSSAI Ã¢?? EFSA - ISO 26000 -Benefits of adopting ISO 26000

UNIT V **9 Hours**

LABOUR POLICY

Labour Law reforms Ã¢?? Importance of labour laws Ã¢?? Elements of labour law Ã¢?? Types of labour laws - Labour policy - Key concerns in Labour Policy -- Employee participation - Labour management cooperation in decision making. `

Total: 45 Hours

Reference(s)

1. S.S. Mishra, Social Accountability in Global Supply Chain Management, Taxmann Publications (P) Ltd, New Delhi, 2009.
2. C. S. Venkata Ratnam,Industrial Relations, Oxford University Press, New Delhi, 2006.
3. R. S. Dwivedi, Human Relations & Organisational Behaviour, Macmillan India Ltd., New Delhi, 1997.
4. M. V. Pylee and Simon George, Industrial Relations and Personnel Management, Vikas Publishing House (P) Ltd., New Delhi, 1995.
5. S. C. Srivastava, Industrial Relations and Labour Laws, Vikas Publications, 2000.
6. http://www.sa-intl.org

18FT022 ERP AND MIS IN APPAREL INDUSTRY 3 0 0 3

Course Objectives

- Students will have fundamental knowledge of information systems.
- Students will know the principles and features of ERP/MIS packages.
- Students will know the applications of ERP/MIS packages.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Apply the fundamental concepts of ERP and MIS in apparel industry.
2. Determine the ERP and MIS requirements with reference to management perspective.
3. Analyse and organize the information in ERP and MIS.
4. Determine the link between ERP systems and front service like E-commerce

5. Select the information system requirements for business operations.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												
2	2	1												
3	3	2												
4	3	2												
5	3	2												

UNIT I **9 Hours**

INTRODUCTION

An overview and features of ERP, MIS integration, ERP drivers, Trends in ERP, ERP in India. ERP system perspective - Management Information System, Operations Support System, Transaction Processing System, Network Structure of ERP system, ERP work flow, Process modeling for ERP systems, Communication in ERP systems, OLTP, (On Line Transaction Processing), OLAP (On Line Analytical Processing). Enterprise Integration application tools for ERP.

UNIT II **9 Hours**

RESEOURCE MANAGEMENT PERSPECTIVE

Business modules in ERP packages, Finance, Production, Human Resource, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution, Resource Management, Business Process Reengineering, Relationship between ERP and BPR, ERP Implementation Life cycle, Implementation methodology, ERP Project Management and Monitoring. ERP and E-Commerce, ERP Culture, ERP and CRM, ERP and SCM, ERP selection issues, ERP in Public Sector Enterprises, Pre- and Post-implementation issues, ERP Vendors, Key ERP consultants in India, Future directions in ERP.

UNIT III **9 Hours**

BASICS OF INFORMATION SYSTEM

Introduction to Information system in business, Need for Information Technology, System concept, Components of an information system, Information system resources, Information system activities, recognizing information system. Expanding role of information systems, Operating support system. Management support systems.

UNIT IV **9 Hours**

INTERNET AND ELECTRONIC COMMERCE

Introduction, Business use of internet, Interactive marketing, Business value of the internet, Customer value and the internet. Fundamentals of Electronic Commerce (EC), EC applications, Business-to-Consumer commerce, Business to Business commerce. Electronic payments and security.

UNIT V **9 Hours**

INFORMATION SYSTEMS FOR BUSINESS ORGANIZATION

Applications of intranets, intranet technology resources, the business value of intranets, the role of Extranets, enterprise collaboration systems. Information systems for marketing, manufacturing, human resources, accounting, financial, transaction processing, managerial and decision support, Information systems for strategic advantages, Strategic application and issues in IT. Role of ERP/ SAP. Ethical and societal challenges of

Information technology.

Total: 45 Hours

Reference(s)

1. Alexis Leon, ERP Demystified, Tata McGraw Hill, New Delhi, 2014.
2. Kenneth C. Laudon, Jane P. Laudon , Management Information Systems: Managing the Digital Firm, 14th edition, Pearson Education, 2015.
3. E. Turban, E. McLean and J. Wetherbe, Information Technology for Management: Transforming organizations in the digital economy, 6th edition, New Jersey, 2008.
4. V. K. Garg, Venkat and N.K.Krishna, ERP Concepts and Practices, PHI Publications, 2003.
5. James A O Brien, George, M. Marakas, Introduction to Information Systems, Tata McGraw Hill, New Delhi, 2008.
6. Langenalter and A. Gary, Enterprise Resources Planning and Beyond, St. Lucie Press, USA, 1999.

18FT023 GRAPHIC DESIGNING FOR LAYOUTS 3 0 0 3

Course Objectives

- To enable students interpret and comprehend fundamentals of graphic designing
- To impart knowledge of designing layouts, websites, newspapers, magazines and brochures
- To enable students develop different types of layouts using design principles

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Analyse graphic design concepts and their associated design process.
2. Evaluate the principles of design and resolve the composition rules for different types of layout design requirements
3. Organize the placement of objects and improve the design interaction.
4. Evaluate the requirements of graphic design applications.
5. Determine the graphic design formats in real time applications.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2												2	
2	3	2											2	

3	3	2	2										3	
4	2	2											2	
5	2	-											2	

UNIT I **9 Hours**

INTRODUCTION TO DESIGN PROCESS

Process of design Research, ideate and prototype. Methodologies of design, design relationship with time: from 1910's to the present time, Proportion geometry and mathematics, Rule of thirds, Visual centre. Layout design gestalt principles.

UNIT II **9 Hours**

TYPOGRAPHY

Typography: Typefaces vs fonts, Anatomy of type, classification of typefaces, fonts, screen fonts, print fonts, selection of typefaces, typeface personalities, Font measuring units: Relative and absolute measurements. Text: kerning, Tracking, line spacing, alignment, vertical alignment, hierarchy, Indentation, hyphenations and justification

UNIT III **9 Hours**

PLACEMENT OF OBJECTS

Articulation techniques, grids & formations: Golden section, grids, columnar grids, columns, fields or modules types of grids. Reality and representational layouts. Matrices patterns, pixels and pointillism. Placement of objects on the page: Narration style, Role of white space, Balance, Juxtaposition, Broad side, colour.

UNIT IV **9 Hours**

GRAPHIC DESIGN APPLICATIONS

10 graphic design trends of the current year, Publication design: newspapers, magazines, books, brochures, flyers. Information design: info graphics, way finding systems (signage designs), Identity design: Logo design, brand identity through packaging.

UNIT V **9 Hours**

WEBPAGE DESIGN

Introduction to UI and UX design, Elements of a webpage design; Visual design, content, navigation, adoptability, colour schemes. Responsive and interactive web pages. 10 website design trends of the current year.

Total: 45 Hours

Reference(s)

1. Paul rand, Thoughts on design, Chronicle books, 2014.
2. Gavin ambrose and Paul harris, Design thinking, AVA publishing SA, 2010.
3. Bath Tondreau, Layout essentials 100 design principles for using grids, Rockport publishers, 2009.
4. Robert bringhurst,The elements of typographic style, version 3.0, Hartley & Marks Publisher, 1996
5. Gavin ambrose and Paul harris, The layout book, AVA publishing SA, 2007.
6. https://paul-rand.com

18FT024 HISTORY OF FASHION 3 0 0 3

Course Objectives

- To enable students, comprehend the evolution of fashion across centuries.
- To distinguish designers and their creations across different era.
- To analyze the cause and effect of fashion across each era.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

- Analyse the elements of fashion till 19th century.
- Evaluate the driving forces of fashion in the early 19th century.
- Analyse the design innovations and designers in the fashion during and between the world wars.
- Analyze various designers and their works in fashion between 1950s -1970s.
- Analyse the features in fashion from 1980's to 2000's.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1		2		1				1					2	-
2		2		1				1					2	
3		2		1				1					3	
4		2		1				1					2	
5		2		1				1					2	

UNIT I **9 Hours**

FASHION TILL 19TH CENTURY

Visual attributes of fashion and its elements: Fashion in Roman era (500 BC – 323 AD), Fashion in the Middle Ages (400 – 1200 AD), The Renaissance period (1350-1520), Elizabethan era (1558-1603), Restoration (1660 – 1700 AD) Victorian Period

(1837–1901) Gibson girl look.

UNIT II **9 Hours**

EARLY 19th CENTURY FASHION

Fashion in the late 1800s-1900s: Rise of fashion designers, Charles Frederick Worth, La Belle Epoque; prewar period of fashion 1890s-first world war. Fashion in 1910s; Famous designers of the era Paul Poirot, Jeanne Paquin, Jacques Doucet. Fashion in the 1920s; Golden era of French fashion, Flapper dress, bob hairstyles.

UNIT III **9 Hours**

FASHION DURING AND POST WAR

Fashion in 1930's; feminine silhouettes, raise of sportswear, Elsa schirapparelli, Madeleine Vionnet, Main Rousseau Bocher. 1940's fashion; Shift of fashion from Paris to London and Newyork, Designer study: Pierre Balmain, Christian Dior and Jacques FathCristobal Balenciaga (Spanish designer) Hubert de Givenchy.

UNIT IV **9 Hours**

FASHION FROM 1950's to 1970's

Fashion in 1950's; Blue denim, T-shirts and Jackets, Rise of mass production, Fashion in the 1960s; rise of clothing brands, unisex clothing, Futuristic clothing, Designers; Yves Sait Laurent, Andres Courreges, Pierre Cardin, Emilio Pucci, Paco Rabanne, Fashion in the 1970s: Punk, bell bottoms, hot phants, Designers of the period; **Kenzo Takada, Calvin Klein, Giorgio Armani, Pierre Cardin.**

UNIT V **9 Hours**

FASHION FROM 1980's to 2000's

Fashion in 1980's; Jean as staple, tailored suits, rise of sports brand, fashion icons from music, princess Diana, Designers of th period; Ralph Lauren and Calvin Klein Vivienne Westwood, Azzedine Alaïa, Fashion in the 1990s; simplistic styles, influenc of globalization, rise of Subcultures, figure hugging clothes, Designers of the period: Michael Kors, Marc Jacobs, Calvin Klei Gianni Versace. Economic and profit driven fashion, Streetwear styles, Designers of this period: Alexander MacQueen, Stell McCartney, Phoebe Philo, Alexander Wang, Marc Jacobs, Tom Ford, Christian Louboutin, John paul gaultier, Hussain chalaya Japanese designers - rei kawakubo, Yohji yamamato and Issey miyake, Manish Arora.

References:

1. Cally Blackman ,100 Years of Fashion Illustration mini, Laurence king publishing,2017.
2. Lydia Edwards, How to Read a Dress: A Guide to Changing Fashion from the 16th to the 20th Century, 2017.
3. Judith Wat, The Ultimate Book of Costume and Style,2012.
4. Teri Agins, The End of Fashion: How Marketing Changed the Clothing Business Forever,2000.
5. Francois Boucher, 20,000 Years of Fashion: The History of Costume and Personal Adornment,1987.
6. https://sewguide.com/evolution-of-history-of-fashion/.

18FT025 INDIAN TRADITIONAL TEXTILES 3 0 0 3

Course Objectives

- To interpret and classify the traditional textiles of India.
- To interpret the significance of the motifs, colours and techniques used in creating the textiles.
- To compare the evolution of motifs and their contemporization across the ages.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
l.Life-long learning: Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
m. Demonstrate the knowledge and understanding of the processes and systems related to textile manufacturing and solve the problems related to production and quality of fibres, yarns and fabrics.

Course Outcomes (COs)

1. Analyse the significance of various hand woven textiles of India with special view on design, colour and technique.
2. Compare different resist dyed textiles of India with special emphasis on the techniques and motifs used.
3. Analyse the motifs and techniques of various form of printed textiles.
4. Analyse various folk arts of India and their significance.
5. Create contemporary motifs and their styles across different arts.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	1	1									2	3	
2	1	1	1									2	3	
3	1	1	1									2	3	
4	1	1	1									2	3	
5	1	1	1									2	3	

UNIT I

HAND WOVEN TEXTILES **9 Hours**

Khadi, Saris-Banaras Brocades, Baluchari Saris, Banarasi Silk saris, Jamdani Saris, Paithani Saris, Kanjeevaram Saris, Chanderi Saris, Maheshwari Saris.Muga silks, Kasavu sarees of kerala, bhagalpuri silks, kota doria sarees of rajasthan, Narayan peth saris, Ilkal saris, Mangalgiri sarees, Bomkai saris. Shawls-Kashmir Shawls, Kullu & Kinnaur Shawls, Wraps of North-east.

UNIT II

RESIST DYE TEXTILES **9Hours**

Bandhani - Bandhani of Gujarat. Bandhej & lehariya of rajasthan, Special Tie-dyed Textiles from rajasthan. Ikat-Patola of Gujarat, Bandhas of odisha, Telia rumal, Pochampalli Ikats.

UNIT III

PRINTED TEXTILES **9Hours**

Bagru prints, Sanganer prints, Kalamkari, Bagru prints, Sanganeri prints, Kalamkari, ajrakh, block printed textiles

UNIT IV

FOLK ARTS **9Hours**

Significance of folk art, rituals, Colours, motifs and medium of the art of **;** Madhubani painting, Tanjore painting, Pattachitra, Rajput painting, Kalamkari, Kalighat painting, Pahari painting, Warli painting**,** Gond painting

UNIT V

INDIAN MOTIFS **9Hours**

Traditional motifs found across various traditional textiles and folk arts; peacock, paisley motif, swans, elephants, sun, trees, gods, horse etc. Classification of motifs: Ritual motifs, border motifs, stylized motifs, significance of the motifs. Contemporization of motifs.

Total: 45 Hours

Reference(s)

1. Barnes, R., Cohen, S. and Crill, R. 2002. Indian Textiles from the Tapi Collection, Indian Book House Pvt. Ltd. Mumbai.
2. Bhavnani, E. 1968. Decorative Arts and Craftsmanship of India. D. B. Taraporevala & Sons, Mumbai
3. Dhanija, J. and Jain, J. 1989. Handwoven Fabrics of India. Mapin Publishing Limited, Ahmedabad.
4. Gillow, J. and Barnard, N. 1994. Traditional Indian Textiles. Thames and Hudson Limited, London.
5. Mehta, R.J. 1984. Masterpieces of Indian Textile. D.B. Taraporevala & Sons, Bombay
6. Singh, M. 2000. Handcrafted Indian Textiles: Tradition and Beyond. Roli Books, New Delhi.
7. www.textilevaluechain.com

18FT026 TECHNICAL DESIGN FOR FASHION **3 0 0 3**

Course Objectives

- Students will have fundamental knowledge about technical design.
- Students will understand the technical requirements of fabrics
- Students will acquire knowledge on determining the product care specifications.

Programme Outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
n. Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyse the components of tech pack used in the Apparel Industry
2. Determine the technical requirements of fabrics.
3. Apply the seam specifications with reference to the product type.
4. Evaluate the product care requirements
5. Outline trim specifications and their standard performance characteristics.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												
2	2	2	3											2
3	2	3	2											2
4	3	2	1											2
5	3	2												2

UNIT 1 **7 Hours**

COMPONENTS OF TECH PACK

Introduction to Technical design, Tech pack – Flat sketch, Sewing Details, Points of Measurement (or POM), Wash Description (if any), Labels and Hangtag Placement, Bill of Materials (or BOM), Packaging Instructions.

UNIT II **11 Hours**

TECHNICAL REQUIREMENTS OF FABRICS

Understanding fabric specifications for apparel design – fabric weight categories & drapability for different silhouettes, fabric fitness for seasonal weather, Tailorability of Apparel fabrics.

UNIT III **10 Hours**

DEVELOPMENT OF SEAM SPECIFICATION

Woven garments – Top wear: Edge finishing seams, Seams for coordinating garment parts, Assembly seams, Top stitching seams. Bottom wear: Edge finishing seams, Seams for coordinating garment parts, Assembly seams, Top stitching seams. Knitted garments – Edge finishing seams, Seams for attaching trims, Assembly seams, Top stitching seams.

UNIT IV **8 Hours**

PRODUCT CARE

Determination of washing parameters for regular product care- Shrinkage, fastness, Appearance. Material specific Ironing temperature specifications, Dry cleaning conditions. Flammability regulations.

UNIT V **9 Hours**

FRAMING TRIM SPECIFICATIONS

Introduction to different types of trims, Trim performance standards- Buttons, Zippers, Velcro, Hook & Eye fasteners, Interlinings. Seams for Trims – labels, tags, fasteners.

FOR FURTHER READING

New Apparel Trims, Applications of seams.

Total: 45 Hours

Reference(s)

1. Subrata Das, Quality characterization of Apparels – Second Edition, Woodhead Publishing Pvt. Ltd, 2019.
2. David J Tyler, Carr and Latham's Technology of clothing manufacture, Blackwell science, 2nd edition, 2000.
3. Ruth E Glock and Grace I Hunz, Apparel Manufacturing: Sewn product analysis, 4rth edition, Pearson, 2004.
4. Kathleen Fasanella, Entrepreneur's guide to sewn product manufacturing, Apparel technical Svcs, 1998.
5. Jacob Solinger, Apparel manufacturing handbook, Bobbin media corporation, 1998.
6. https// http://www.garmenco.org/index.html

18FT027 NEW GENERATION FIBER

3 0 0 3

Course Objectives

- To learn and acquaint with the basics of yarn formation and fabric formation to supplement the subsequent learning of garment making and fashion portfolio development
- To learn the physical, mechanical and comfort properties of fibers.
- To learn and acquaint with the basics of yarn formation and fabric formation.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Differentiate the physical and chemical properties of textile fibers, production techniques (Both natural &manmade fibers) and its applications.
2. Evaluate the different types of mechanical and comfort properties of fibers and its measuring techniques.
3. Apply the principles of preparatory process in spinning and comprehend their production and quality parameters.
4. Apply the principles of modern spinning systems and comprehend their production and quality parameters.
5. Apply the principles of fabric formation in looms and classify the types of fabrics produced in them.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2												
2	3	1												
3	2	3												
4	2	3												
5	2	2												

UNIT I **9 Hours**

The super-fiber with new performance:

Introduction, basic classes of super-fiber, the need for a strong fiber, concept of "gel-spinning, The aramid fiber race , Polyacetal fiber, Strong Vinylon RM, New liquid crystalline polymers: engineering plastics, Vectran: a fully aromatic polyester fibre, Developing polyallylate fiber, Final stage of pitch-based carbon fiber development, use of super fibres, The future of super-fibers 3. High-tech fibers: A silk-like fiber that surpasses natural silk, ultra-fine fibers, Perfumed fibers, Power fibers that store solar energy.

UNIT II **9 Hours**

Progression of high-tech fibers:

Introduction, Biotechnology and fibers, Electronics and fibers , Cars and fibers, Fibers in space, Fibers and nuclear power, Fibers in sport, Fibers for geotextiles, Fibers in the ocean.

UNIT III **9 Hours**

New high-tech fibers:

Various categories of high-tech fibers, Development of Shingosen, Design of specialist fibers, Fabrics for relaxation using 1/ f fluctuations, new arrivals.

UNIT IV **9 Hours**

Fibers for the next generation:

High-tenacity and high-modulus fibers, micro denier (ultra-fine) fibers and bio mimetics, the next stage: technological improvements, new frontier fibers (super-function fiber materials, etc.), super-biomimetic fiber materials, super-natural materials, resources recycling, fibers for health. Carbon Fibres.

UNIT V **9 Hours**

Fabrics for the next generation:

Skin-like fabrics, Chameleonic fabrics, Photochroism-controlled clothing material, Iridescent textiles, Protein plastics with the feel of human skin, Reversible Fabrics.

Reference(s)

1. J.W.S. Hearle&W.E.Morton Physical Properties of Textile Fibers, Woodhead publishing, 4th Edition, ISBN 9781845694425, 2008
2. M. K. Talukdar, P. K. Sriramulu, and D. B. Ajgaonkar, Weaving: Machines, Mechanisms, Management, Mahajan Publishers Pvt. Ltd. 1998.
3. W. S. Murphy, Handbook of Weaving, Abhishek Publications, 2001.
4. Albrecht Wilhelm,Fuchs Hilmar, and Kittelmann Walter, Nonwoven Fabrics: Raw Materials, Manufacture, Applications, Characteristics, Testing Processes, 2002.
5. R. K. Dharmadhikary, T. F. Gilmore, H. A. Davis and S. K. Batra, Thermal Bonding of Nonwoven Fabrics, Textile Progress, Vol. 26, No.2, Textile Institute, 1995.

18FT028 SUSTAINABILITY IN PROCESSING 3 0 0 3

Course Objectives

- To impart knowledge about the environmental and ecological aspects of various chemicals, dyes and auxiliaries used in processing.
- To make the students aware of the alternative chemicals and dyes that can replace the harmful chemicals.
- To update the students on the various rules, regulation that governs the textile processing industry

Programme Outcomes (POs)

Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Analyse the concepts of various types of pollution created during chemical processing
2. Analyze the various ecofriendly chemicals used in dyeing, printing and finishing
3. Apply the eco audit procedure to ensure no harmful chemical were used during chemical processing
4. Analyze the eco norms and eco labelling to ensure no harmful chemical were used during chemical processing
5. Analyze the eco-parameters by testing in instruments

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3					1							
2	2	3												
3	2													
4	2						1							
5	2	3												

UNIT I **9 Hours**

INTRODUCTION

Need – Concepts –Impact of pollution on environment – Eco Standards. Environmental friendly fibres – Harmful substances in natural fibres – Eco-standards. Banned amines and toxic substances – Sources of contaminations – Approaches for Eco-processing: Reduce – Recycle – Reuse.

UNIT II **9 Hours**

ECO-FRIENDLY PREPARATION, DYEING, PRINTING AND FINISHING

Eco-friendly pre-treatment methods – Solvent assisted preparation – ozone bleaching – per acetic acid. Hazardous nature of synthetic dyes – types of hazards – alternative dyes. Eco-friendly chemicals and auxiliaries in dyeing and finishing: Reducing agents – oxidizing chemical – thickeners – sequestering agents – bio-surfactants. Eco-friendly finishing chemicals: Cross-linking treatment – formaldehyde free chemicals – softeners – bio-polishing – flame retardant finish – preservatives.

UNIT III **9 Hours**

ECO-AUDIT

Eco-audit – Procedure – Environmental Impact Assessment – Sampling methods – Audit methods. Reduction of pollution by prevention – Eco-testing. Environment Management System – Developments – IS0 14000 - Concepts – Clauses – Certifying bodies - Certification. Occupational safety and Hazards: OHSAS 18000 – Concepts – Clauses – Certification Methods.

Introduction to Social Accountability 8000.

UNIT IV **9 Hours**

ECO-NORMS AND ECO-LABELING

Need – Assessment of toxicity - Norms for toxic chemicals: Carriers – Emulsions - Formaldehyde – Pesticides – Amines – Halogenated compounds - Heavy metals – Inorganic chemicals. Norms for baby clothing and adult clothing. Eco-labelling – Trademarks - Toxic substances in textile processing – Precautions – Assessment – Standards - Certifying Bodies.

UNIT V **9 Hours**

TESTING OF ECO-PARAMETERS

Instrumental Analysis – Chromatographic Methods – Spectroscopy – Inductively Coupled Plasma. Detectors: Flame & photo ionization – electron capture – Thermal conductivity – Flame photometer. Interpretation of test results.

Total: 45 Hours

Reference(s)

1. Guowen Song, Improving comfort in clothing, The Textile Institute and Woodhead Publishing, UK,2011
2. Asokan R., Eco-Friendly Textile Wet Processing, NCUTE Publications, New Delhi, 2001
3. Eco friendly Textiles: Challenges to the Textile Industry, Textiles Committee, Mumbai, 1996.

18FT029 RISK ANALYSIS IN GARMENT INDUSTRY 3 0 0 3

Course Objectives

- To impart knowledge on various risk in garment industry.
- To impart knowledge on the raw material, health and safety.

Programme Outcomes (POs)

a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
d. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data,
and synthesis of the information to provide valid conclusions.
g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
k. Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Course Outcomes (COs)

1. Analyse the type of risks and the risk management in apparel industry.
2. Analyze the risk during the production time.

3. Analyze the financial issues and fluctuation of price.
4. Analyze the risk in raw material and labour in apparel industry.
5. Analyze the health and safety measures for employees.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	1	2						1	1	2			
2	2	2	2				1		1	2				
3	1	2	2						2	2	2			
4	1	3	2				1		2	2				
5	2	3	2				1		1	1				

UNIT I **9 Hours**

RISK MANAGEMENT

Risk management- traditional and new perspectives, Type of risks- Operation risk, Employee risk, purchasing power, Hazard risk, Technology risk, currency risk, strike, shutdown Sustainability, Digitalization.

UNIT II **9 Hours**

RISK IN GARMENT PRODUCTION

Lack of planning and coordination, delay in production start, operator absenteeism. Frequent change in production planning, Insufficient Information, Problem with Raw Materials. Increase of utility cost, adaptation of automation and infrastructure issues.

UNIT III **9 Hours**

FINANCIAL COORDINATION

Internal risk, External risk, global risk. Clients and product business practice, damage to physical assets, bargaining power of supplier and customer, fluctuation of price.

UNIT IV **9 Hours**

RAWMATERIAL AND LABOUR

Raw Material – Fabrics, trims and packing items. Maintain lead time for In-house material, Quality and defect of raw material, color matching, testing, and cost. Labour - Skilled and unskilled labour, Time management, employee salary

UNIT V **9 Hours**

HEALTH AND SAFETY

Health and safety of employees, customers, volunteers, participants. Employee risk management - Illness, infections, injuries. Plant, equipment, environment safety. Employment practices and workplace safety, Insurance policy

Total: 45 Hours

Reference(s)

1. https://www.somo.nl/wp-content/uploads/2004/01/Critical-Issues-in-the-garment-Industry.pdf
2. https://www.fibre2fashion.com/industry-article/8496/3-major-challenges-faced-by-apparel-and-fashion-industry-in-the-year-2019
3. https://www.wiego.org/garment-workers
4. The garment manufacturer risk assessment- SWOT analysis

OPEN ELECTIVES

18FT0YA FASHION CRAFTS 3 0 0 3

- To impart theoretical and practical knowledge about various handi-craft techniques
- To enhance innovative skills on hand crafts.
- To build confidence on doing handicrafts.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

g. g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

l. l. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Analyse the classification, techniques and criteria for selecting raw materials for making various handicraft materials and produce textile based handicrafts. Produce various decorative and appealing products
2. Design and construct various wall hangings and fashion accessories.
3. Design and construct toys and accessories
4. Design and construct head accessories, home furnishings and paintings
5. Design and construct various decorative and appealing products for interiors

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	1	3				2		2	2		2	2	
2	3	2	3				1		2	3		2	2	
3	3	2	3				2		2	3		2	2	
4	3	2	3				2		2	3		2	2	
5	3	2	3				2		2	3		2	2	

UNIT I **9 Hours**

TECHNIQUES OF HANDICRAFT MATERIALS

Definition of Handicraft, Classification: Reusable, Non reusable, Raw materials used in various craft materials: printed, embroidered, stitched and handmade, Criteria for selection of raw materials: material types and end uses.

UNIT II **9 Hours**

DECORATIVE AND APPEALING PRODUCTS INTERIORS

Designing and Construction procedures for following various decorative and appealing products: Wallhangings by using threads, Shawls, Ties, Tapestry's, Scarves, Purses, Veils.

UNIT III **9 Hours**

DECORATIVE AND APPEALING PRODUCTS ACCESSORIES

Designing and Construction procedures for following various decorative and appealing products: Exhibition pieces, Bracelets by using braid structure, Cushions, Fashion Trims, Handbags, thread bangles, Hair accessories

UNIT IV **9 Hours**

DECORATIVE AND APPEALING PRODUCTS ORNAMENTS AND HOME FURNISHINGS

Designing and Construction procedures for following various decorative and appealing products: Hats/headpieces, Necklaces, Pendants, Brooches, Tablemats, Garlands, Painting of Fabric.

UNIT V **9 Hours**

DECORATIVE AND APPEALING PRODUCTS - FANCY ITEMS

Designing and Construction procedures for following various decorative and appealing products: Home decor items, Jewelry Box, Utility Holder, Hanging Wall Pictures, quilling earrings, Gift items.

Total: 45 Hours

Reference(s)

1. Handmade in India: A Geographic Encyclopaedia of India Handicrafts. Abbeville press; 1 edition (October 20,2009)
2. Encyclopaedia of Card making Techniques (Crafts), Search Press Ltd, illustrated edition, 2007
3. All about Techniques in Illustration, Educational Series, 2001
4. Printing by Hand: A Modern Guide to printing with Handmade stamps, Stencils and Silk Screens, STC Craft/A Melanie Falick Book, 2008
5. Materials & Techniques in the Decorative Arts: An Illustrated Dictionary, University of Chicago Press, 2000
6. https://www.marthastewart.com/274411/fashion-crafts

18FT0YB FASHION ACCESSORIES 3 0 0 3

Course Objectives

- To impart knowledge about Fashion accessories and their uses in enhancing the personality of the wearer.
- To develop students knowledge on selection of suitable accessories.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and

engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
g. g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
l. l. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Generate the basic sketching for the fashion accessory designs
2. Evaluate the functional and aesthetic performances of the designed garment accessories.
3. Design leather accessories and apply the concepts of pattern making techniques.
4. Design ornamental accessories by analyzing their functional and aesthetic performances
5. Design special accessories for fashion styles

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2		3				3		3	2		2	2	
2	2	1	2				3		2	2		2	2	
3	2	2	3				3		2	3		2	2	
4	2	2	3				3		2	3		2	2	
5	2		3				3		2	3		2	2	

UNIT I **9 Hours**

INTRODUCTION TO ACCESSORIES

Definition and importance of accessories in fashion design, classification of accessories, Definition of trims, Difference between trims and accessories, sketching of basic shapes of various accessories, Concepts of three-dimensional sketching.

UNIT II **9 Hours**

GARMENT ACCESSORIES

Selection of materials, design, functional and aesthetic performance of Ribbons, Laces, appliques, Woven labels, Buttons, Zippers, Hooks and Eyes, Velcro, Scarves, Socks, Stockings, Veils

UNIT III **9 Hours**

LEATHER ACCESSORIES

Selection of materials, design, functional and aesthetic performance and various styles of footwear, belts,

gloves, hand bags, hats, wallets. Concepts of pattern making techniques, basic machineries used for stitching.

UNIT IV **9 Hours**

ORNAMENTAL ACCESSORIES

Selection of materials, design, functional and aesthetic performance of Pendants, Necklaces and types of necklace, Rings, Ear rings and types of Earings, Bangles, Bracelets, Anklets.

UNIT V **9 Hours**

SPECIAL ACCESSORIES

Neck gaiters, Tie clips, walking sticks, wigs, mask, handkerchiefs, Occasion gloves, Electronic gadgets, Earmuffs.

Total: 45 Hours

Reference(s)

1. Stacy LoAlbo, Vintage Fashion Accessories, Krause Publications, China,2009
2. Ritu Bhargav,Design Ideas and Accessories, Om Books International,2004
3. Patty Brown and Janet trice, Wear Apparel Analysis, Prentice Hall, NewDelhi, 2000.
4. Phyllis Tortora, Encyclopedia of Fashion Accessories, OmBooksInternational, NewDelhi, 2003.
5. Lucy Pratt and Linda Woolley, Shoes (V&AFashionAccessories), Victoria and Albert Museum, UK, 1999.
6. Lannoo, Fashion and Accessories (Fashion), Lannoo International, Belgium, 2007.

18FT0YC FASHION VISUAL MERCHANDISING 3 0 0 3

Course Objectives

- Acquaint the students with the concept of visual merchandising.
- Acquire knowledge about the store planning and assortment planning techniques.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Analyse visual merchandising & role of visual merchandiser and display basics.
2. Determine the store planning requirements for a store.
3. Evaluate the type of fixtures and mannequins with reference store type.
4. Design the signcommunication systems applied in store planning.

5. Upon the completion of the course, the students will be able to design a planogram and perform assortment planning for a store.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2											3	
2	3	2											3	
3	3	2											3	
4	3	2											3	
5	3	2											3	

UNIT I **9 Hours**

UNIT 1 VISUAL MERCHANDISING AND DISPLAY BASICS

Visual Merchandising -Introduction, Objectives, Role of a Visual Merchandiser of Marketing - Different types of stores. Approaches in Visual Merchandising In house staffing, Departmental Store Approach and Small Store Approach.

Display basics Elements of design, Principles of design. Fashion merchandise presentation- Methods. Design composition two methods. Color Wheel and Color schemes. Lighting Light sources, Types of lamps, Light fixtures.

UNIT II **9 Hours**

UNIT 2 ELEMENTS OF DISPLAY

Elements of display Introduction. Store front Signs, Marquees, Outdoor lighting, Banners, Planters, Awnings, Windows and its types. Masking and proscenia. Store layout Objectives, Allocation of space, Types Grid/straight, Curved/race track, Free-flow/Boutique, Spine and Herring bone layout. Utilization of store space Lifts, staircase, Elevators, Point of Purchase display. Store Interior Store atmosphere, Sound usage, Scent, Importance of flower arrangements in stores. Interior display - Type of display and display settings.

UNIT III **9 Hours**

UNIT 3 MERCHANDISE FIXTURES AND MANNEQUINS

Merchandise Fixtures - Role of fixtures, Types, Selection of fixtures. Mannequins Types of mannequins, alternatives of mannequins. Dressing mannequins Wigs and make up. Props choosing properties, rent, buy, or build. Display props, Furniture as props. Supplies: Setting up shop - The display shop studios, the toolbox, shop materials.

UNIT IV **9 Hours**

UNIT 4 SIGNAGES AND COMMUNICATION

Graphic and Signage - Need, Types of signage. Sign production in supermarkets and fashion stores. Sign sizes – selection of colors. Sign maintenance. Vendors and markets- The National Association of Display Industries, fashion shows, trade organizations and sources, antique shops, flea markets, and auctions.

UNIT V **9 Hours**

UNIT 5 MERCHANDISE MANAGEMENT AND ASSORTMENT PLANNING

Planogram Introduction, design and direction of flow. Store planning and design. Merchandise management

Mark up and mark down merchandise management. Assortment planning Introduction, Based on Color, Sizes, Style.

Total: 45 Hours

Reference(s)

1. Pegler M.M., Visual Merchandising and Display IV Edition, Fair child Publications, New York, 2011
2. Robert Colborne, Visual Merchandising: The Business of Merchandise Presentation, Delmar Learning, 1996.
3. Jay Diamond and Ellen Diamond, Contemporary Visual Merchandising and Environmental Design, Prentice Hall, New Delhi, 2007.
4. Tony Morgan, Visual Merchandising: Windows and In-Store Displays for Retail, Laurence King Publishing,Australia,2008

18FT0YD INTERIOR DESIGN 3 0 0 3

Course Objectives

- To impart knowledge on interior design.
- To improve the design skills, sustainable with socially-conscious designs

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
f. f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Analyse the elements of interior design concepts and resolve the personality requirements.
2. Create graphical representations of interior design concepts
3. Resolve the space planning requirements of residential home and retail centers as per CPWD guidelines
4. Determine the aesthetic requirements of interior design components
5. Analyse the roles and responsibilities of interior designer

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	3		1								2	
2	3	2	3		2	3		2					3	
3	3	3	3		2	2		2					2	
4	3	3	3		2	3		2					2	
5	3	2			2			3					3	

UNIT I **9 Hours**

INTRODUCTION

Interior designing - definition, importance, requirements and types - Structural design, Decorative Design - Designing interiors, Good taste; Design themes, types and application. Personality of the Home - Art elements - Line: types, characteristics and importance; form: size and shape, characteristics; Colour - sources, qualities, emotional effects, colour wheel and schemes.

UNIT II **9 Hours**

GRAPHICAL PRESENTATIONS

3D compostion; Isometric and Axonometric- Still life- Furniture Sketching- Object Drawing with color rendering - Interior elements, Lighting, plants. Perspective, Axonometric Isometric drawing. Orthographic Projection - Lifts and escalators.

UNIT III **9 Hours**

SPACE PLANNING

Space planning concepts -interiors, circulation. Definition, application of ergonomic principals in interiors. Residential house space planning case study-CPWD guidelines. Lighting for different locations and activities, measurement, ventilation and indoor air quality, noise control methods.

UNIT IV **9 Hours**

INTERIOR COMPONENTS

Application of colour in interiors; Texture - types and significance; Pattern: types and effects; Light - importance. Importance of Furniture Design for Interiors- Ancient Age / Middle Age / Contemporary. Doors, Windows, Staircase designs, False Ceiling, Partitions, Wall Paneling, Comics, Mosaic, Cladding- Flooring and Wall Cladding

UNIT V **9 Hours**

ROLES AND RESPONSIBILITIES OF INTERIOR DESIGNER

Role of an Interior Designer- Responsibility towards society and need of an Interior Designer to better the environment- Ethics and Code of Conduct- Responsibility towards client, contractor and supplier, Estimation. Professional Fees- Work of an Interior Designer- Making of portfolio, JD Annual Design Awards.

Total: 45 Hours

Reference(s)

1. Joanna Gaines, Homebody: A guide to creating spaces you never want to leave, Harper design, 2018.
2. Erin gates, Elements of Style: Designing a Home and a life, Simon and Schuster, 2014.
3. Simon Dodsworth, The Fundamentals of Interior Design, AVA publishing, 2009.
4. V. Mary. Knackstedt, the Interior Design Business Handbook: A Complete Guide to Profitability, Wiley, New Jersey; 2006.

5. M. G. Shah, C. M. Kale, and S.Y. Patki, Building Drawing with an Integrated Approach to Build Environment, Tata McGraw Hill, 2002.
6. Https://eclectictrends.com

18FT0YE SURFACE EMBELLISHMENT 3 0 0 3

Course Objectives

- To familiarize the students about the various techniques of surface embellishment with relevance to garment embellishments.
- To aware of various types of embroidery and methods of producing it.
- To make the students confident about doing surface embellishment work

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c. c. Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
h. h. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Analyze the raw material requirements for surface ornamentation and its application
2. Apply hand embroidery stitches on fabric and show the stitch development procedure in diagrammatic representations
3. Apply the machine and computerized embroidery stitches
4. Analyze the surface embellishment techniques and its application
5. Assess the quality maintenance parameters of all embroidered products and analyze the 6 traditional embroidery techniques

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

1	2	3	2					1						
2	2	3	2						2				2	2
3	2	3	2		3								2	2
4	2	2	2						2				2	2
5	2	2	2						2					2

UNIT I **9 Hours**

INTRODUCTION TO SURFACE EMBELLISHMENT

Introduction, Definition, Need, Types, Raw materials, Importance of surface embellishment, Selection of needle, thread and fabric for hand embroidery and machine embroidery. various methods of surface embellishment- embroidery and surface ornamentation.

UNIT II **9 Hours**

HAND EMBROIDERY

General rules for hand embroidery. Types of hand embroidery stitches-Running, Couching, Button hole, Satin, Long & Short, Wheat, Chain, Stem, Herringbone, Cross stitch, Knotted stitches, Fish bone, Fly stitch, Braids, Back, Hem, Seed, Needle weaving, Whip stitches.

UNIT III **9 Hours**

MACHINE EMBROIDERY

General rules for machine embroidery. Types of frames and methods of transferring the designs. Attachments to sewing machines for embroidery, Types of machine embroidery stitches- Eyelet work, Cut work, patch work, Mirror work, Applique, Shaded embroidery, Shadow work, Bead and Sequins work, Vermicelli, Zigzag, Granite stitch. Computerized embroidery machine- Concept of design and development, software used in embroidery machines, process of designing, method and types of stitch application, punching and digitizing.

UNIT IV **9 Hours**

EMBELLISHMENT TECHNIQUES

Materials used and Applications. Types of embellishment techniques- fabric painting-hand, Stencil-dabbing and Spraying. Dyeing and printing-advanced tie and dye techniques, batik and block printing. Trimmings and decorations-Laces, Pompons, Fringes, Tassels, Tucks, Show buttons, Crocheting.

UNIT V **9 Hours**

TRADITIONAL EMBROIDERIES OF INDIA AND CARE

Care and maintenance of embroidered articles-care and maintenance methods for embroidered apparel, pressing. Traditional Embroideries of India-Phulkari, Kasuti, Kashmiri embroidery, Kutch work, Chikkankari, Kantha.

Total: 45 Hours

Reference(s)

1. Ruth Chandler, Modern Hand Stitching-Dozens of stitches with creative free-form variations,2014
2. Sophie Long, Mastering the Art of Embroidery: Traditional Techniques and Contemporary Applications for Hand and Machine Embroidery, Heritage Publishers, London, 2013
3. Christen Brown ,Embroidered & Embellished, C&T Publishing, 2013
4. Sheila Paine, Embroidered Textiles, Thames and Hudson Publisher, UK, 1990.

5. Gail Lawther, Inspirational Ideas for Embroidery on Clothes & Accessories, Search Press Ltd, UK, 1993.
6. http://www.needlenthread.com/tag/hand-embroidery-stitches

ONE CREDIT COURSES

18FT0XA LEAN MANUFACTURING 0 0 0 1

Course Objectives

- To enable the students interpret and appraise lean manufacturing concepts.
- To enhance innovative skills on hand crafts.
- To build confidence on doing handicrafts.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Explain the concepts related to lean manufacturing.
2. Explain the implementation procedure for lean manufacturing.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												

16 Hours

UNIT I

LEAN MANUFACTURING

Benefits of lean manufacturing-Performing a strategic business analysis Methodology to transform facility into lean manufacturing-Understand Product, Process and Demand-Line layout, process linking and balancing-Kanban strategy-Team Establishment-Lean Implementation Milestone checklist-Managing lean manufacturing line

Total: 16 Hours

Reference(s)

1. Dennis P Hobbs, Lean Manufacturing Implementation, J Ross Publishing Inc, USA, 2004.

18FT0XB INTELLECTUAL PROPERTY RIGHTS 0 0 0 1

Course Objectives

- To enable the students appraise intellectual property rights issues.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering

problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Explain various types of intellectual property rights
2. Apply the patent searching strategies

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	-	-												

UNIT I **16 Hours**

INTELLECTUAL PROPERTY RIGHTS (IPR):

Intellectual Property Rights(IPR): Introduction, Purpose, Benefits, categories- Industrial Property and Copyrights. Industrial Property: Patents, trademarks, industrial designs, and geographic indications of source. Pattern- Types, Conditions and purpose of patents, procedure of application of pattern, history of patent act, Indian and International patents, powers of government under IPR, Patent Registration Forms. Case studies relating to IPR.

Total: 16 Hours

Reference(s)

1. NR Subbaram, Demystifying Intellectual Property Rights, ISBN:9788180385780, LexisNexis, 2011
2. Sharon Givoni, Owning It: A Creative"s Guide to Copyright, Contracts and the Law, Creative Minds Publishing, 2015.
3. www.ipindia.nic.in/

18FT0XC BUYERS MANUAL **0 0 0 1**

Course Objectives

- To enable the students interpret buyer manual specifications.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Interpret the details of a spec sheet
2. Interpret and appraise the tech pack parameters and corresponding standards.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												

UNIT I **16 Hours**

BUYERS MANUAL

Buyers- domestic and international buyers requirements and standards test procedures special requirements 3rd party testing final approval.

Total: 16 Hours

Reference(s)

1. www.marksandspencer.com
2. www.hm.com
3. www.nike.com
4. www.zara.com

18FT0XD BIO-MIMCRY IN FASHION 0 0 0 1

Course Objectives

- To enable the students analyze biomimcry inspirations applied in fashion design.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
m. m. Understand and incorporate: Interpret trends, decipher fashion movements, apply the knowledge of elements of design and Gestalt theory of visual perception; and incorporate sustainable decisions into their design artworks, fashion products and accessories.

Course Outcomes (COs)

1. Appraise the visual patterns existing in nature
2. Explore design development using any one element of nature.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3												2	

16 Hours

UNIT I

BIO-MIMICRY IN FASHION

Introduction to bio-mimicry, Texture development -Replication of Biomimicry inspired texture- Geometry for fashion styling and visual display techniques - Life style accessory design inspired from nature

Reference(s)

1. www.nventorspot.com
2. www.ecouterre.com

18FT0XE DRAPING AND FITTING 0 0 0 1

Course Objectives

- To enable students comprehend the requirements of draping and fitting.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an

engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Demonstrate development of styles using draping techniques

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2												2

UNIT I **16 Hours**

DRAPING AND FITTING

Definition - standards of good fit, Fitting techniques, Fitting problems and their remedies Steps in preparing a garment for proper fit (various styles of garments, Checking the fit of the garment

Total: 16 Hours

Reference(s)

1. Hilde Jaffe, Nurie Relis, Draping for Fashion Design , Pearson Education/Prentice Hall, 2012
2. Helen Joseph-Armstrong, Pattern Making for Fashion Design, Pearson Education/Prentice Hall, 2010
3. Mary Mathews, Practical clothing construction part I and II, cosmic Press, Chennai.(1986).

18FT0XF PRODUCT CERTIFICATION IN GARMENT INDUSTRY

0 0 0 1

Course Objectives

- To enable the students explore garment product certification requirements.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Explain the different product certifications available in garment industry.
2. Explain the implementation procedures for the same.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											

UNIT I

PRODUCT CERTIFICATION

Types of product certification, Principles and Implementation procedures- Wool mark / Wool blend mark, Oeko-tex, Organic clothing / GOTS, Handloom mark, Silk mark, LEAF certification(eco-conscious apparel), Fair Trade Certified Clothing, Global Recycling Standard, Worldwide responsible accredited production (WRAP), label.

Reference(s)

1. http://www.etad.com/
2. www.global-standard.org/
3. www.oeko-tex.com/
4. http://www.tuv-sud.com/industry/consumer-products-retail/softlines/textile-clothing

18FT0XG DENIM FABRICS AND GARMENTS

Course Objectives

- To enable the students analyze designs in denim fabrics and garments.

Programme outcomes (POs)

a. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Explain denim dyeing processes and the final finishes achieved in them.
2. Explain washing treatments for denim fabrics and denim garments.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											

UNIT I **16 Hours**

DENIM FABRICS AND GARMENTS

Yarn Requirements and Characteristics for Denim- Weaving of Denim Fabrics-Physical properties of Denim Fabrics. Dyeing of Warp Yarn- Indigo Dyeing- Indigo &Sulphur dye combinations. Finishing of denim fabrics process conditions, machineries and chemicals used, Stone and Stoneless Washing of Denim Garments. Bleaching of Denim Garments using Oxidative and Enzyme Treatments- Backstaining of Garments and Remedies.

Total: 16 Hours

Reference(s)

1. M. S. Parmar, S. S. Satsanji and Jai Prakash, Denim A Fabric for All, NITRA Publications, 1996.
2. J. V. Rao, Denim Washing, Northern India Textile Research Association, Ghaziabad, 2006.
3. Wolfgang D. Schindler, Peter J.Hauser, Chemical Finishing of Textiles, Woodhead Publishing , UK,2004
4. https://textlnfo.wordpress.com/2011/11/03/fabric-and-garment-finishing-basic-washes-in-denim- fabric/

18FT0XH FABRIC DEVELOPMENT AND SOURCING 0 0 0 1

Course Objectives

- To enable the students determine the fabric development options.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Analyze the fabric construction and conclude the fabric specifications required for the design.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											

UNIT I **16 Hours**

FABRIC DEVELOPMENT AND SOURCING

Trade shows, Knowing geographical location of fabric sources, Development of fabric, Fabric specifications- Colour matching and quality approval, Sampling, Pricing, Garment making, Bulk fabric execution- Bulk approvals, Meeting Buyer requirements and Practical analyses of different garments and know how on fabric sourcing.

Total: 16 Hours

Reference(s)

1. www.ralphlauren.com
2. http://apacpoloexpress.polo.com
3. www.caionline.org

18FT0XI SKILL DEVELOPMENT ON APPAREL PRODUCTION PLANNING PACKAGE

0 0 0 1

Course Objectives

- To enable the students acquire production planning skills.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Explain the production planning concepts and develop planning schedules.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											

UNIT I **16 Hours**

SKILL DEVELOPMENT ON APPAREL PRODUCTION PLANNING PACKAGE

Industrial Engineering Productivity- Work study Production Planning Software for Garment Manufacturing - An overview, Evolve by Fast React, Plan-IT by Gemserp, Production Planning and Control module by APPS, MAE by Parallax, Stage Production Planning Management, Pro-Plan by Methods Apparel, Apparel Connect

Total: 16 Hours

Reference(s)

1. Paula J. Myers-McDevitt, Apparel Production Management and the Technical Package, 2010
2. George Kanawaty, ILO, Introduction to Work Study, Universal Publishing Corporation , Mumbai, 2005
3. http://www.fastreact.ru/onlinepics/9_Australian_Country_Spinners.pdf
4. http://www.onlineclothingstudy.com/2011/12/production-planning-software-for.html

18FT0XJ VISUAL MERCHANDISING 0 0 0 1

Course Objectives

- To enable students comprehend the requirements of visual merchandising and develop fashion merchandise presentation.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Demonstrate the concepts of visual merchandising and develop a fashion merchandise presentation.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2		2		1									

UNIT I **16 Hours**

VISUAL MERCHANDISING FOR FASHION

Design composition – Two composition methods, basic design methods, creating attention, creating displays, design solutions, and the purpose of design. The color wheel, color planning for the selling floor, colour communication - customers, season, merchandise.

Total: 16 Hours

Reference(s)

1. Jay Diamond and Ellen Diamond,*Contemporary Visual Merchandising and Environmental Design*, Prentice Hall, New Delhi, 2007.
2. Elaine Stone, *Fashion Merchandising*, Blackwell Science Ltd., 2000.

3. http://www.vmsd.com
4. http://www.retaildesignblog.net

18FT0XK ESSENTIALS OF PHOTOGRAPHY 0 0 0 1

Course Objectives

- To enable students understand the specification requirements of camera for photo shooting the job subject.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Explain the camera specifications for photo shooting the job subject.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2		2		1									

UNIT I **16 Hours**

ESSENTIALS OF PHOTOGRAPHY

Purpose of photograph – Illustrations, Visual aid, Research records, Research data. Different focal lenses wide angle lens, telephoto lens, macro lens, standard lens. Camera – accessories. Specification requirements for the job subject – Sensor size, lighting level, aperture size, lens focal length, Shutter speed, Zoom capacity.

Total: 16 Hours

Reference(s)

1. Bruce Barnbaum, The Art of Photography: A Personal Approach to Artistic Expression, 3rd edition, Rocky nook, 2017.
2. David Bate, Photography: Key concepts, 2nd edition, Bloomsbury publishing, 2016.
3. Kindersley Dorling, The Beginner"s Photography Guide, Dorling Kindersley ltd, 2016.
4. Mark Galer, Photography foundations for Art and design, 4rth edition, Focal press, 2007.
5. http://www.artofvisuals.com
6. http://www.glamflame.net

18FT0XL FASHION PRODUCT TESTING FOR SUSTAINABILITY 0 0 0 1

Course Objectives

- To enable students understand the sustainability testing requirements for fashion garment products.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Course Outcomes (COs)

1. Explain the sustainability testing requirements for fashion garment products and organize testing

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2		2		1									

UNIT I **16 Hours**

FASHION PRODUCT TESTING FOR SUSTAINABILITY

Restricted substances in Apparels testing requirements: Banned amines in azo dyes, Allergenic disperse dyes, Carcinogenic dyes, Formaldehyde, Chlorinated organic carriers, Phthalates, Chlorinated paraffin, Residual pesticides.Protocols: ZDHC, Greenpeace, Oekotex.

Total: 16 Hours

Reference(s)

1. Dr. Subratadas, Product safety and restricted substances in Apparels, 1st edition, Woodhead publishing India Pvt Ltd, 2017.
2. Restricted Substances List: Toolkit for Apparel Companies (manual), Modint, 2015.
3. Manufacturing restricted substances list version 1.1 (manual), ZDHC programme, retrieved from https://www. Roadmaptozero.com, 2015.
4. https://industries.ul.com
5. http://www.textilestandards.com

18FT0XM PHOTOSHOP FOR FASHION DESIGN 0 0 0 1

Course Objectives

- To enable students use the photoshop platform for editing and developing fashion designs

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Illustrate designs in photoshop and edit them.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2		2		1									

UNIT I **16 Hours**

PHOTOSHOP FOR FASHION DESIGN

Edit a photo image and prepare a mood board, Prepare a industry ready print design.

Total: 16 Hours

Reference(s)

1. Robert Hume, Fashion and Textile Design with Photoshop and Illustrator: professional practice. 2016. Bloomsbury.
2. Sandra Burke, Fashion computing: Design techniques and CAD. 2006. Burke publishing.

18FT0XN ILLUSTRATOR FOR FASHION DESIGN 0 0 0 1

Course Objectives

- To enable students use illustrator platform for developing fashion designs and illustrate them.

Programme Outcomes (POs)

a. a. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
e. e. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
n. n. Articulate, collaborate and solve: Articulate design aesthetics, communicate product values, collaborate across disciplines as member and leader; and envision solutions in fashion systems: design, technology, production and management.

Course Outcomes (COs)

1. Illustrate fashion flats and range board for fashion merchandize.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3		2			1		1						

UNIT I **16 Hours**

ILLUSTRATOR FOR FASHION DESIGN

Technical flat sketch, Specification sheet, range board with digital fashion illustrations and patterns.

Total: 16 Hours

Reference(s)

1. Robert Hume, Fashion and Textile Design with Photoshop and Illustrator: professional practice. 2016. Bloomsbury.
2. Marianne center and Frances Vereker. Fashion designers hand book for Illustrator, 2011,2nd edition, Wiley publications

ADDITIONAL ONE CREDIT COURSES

18GE0XA ETYMOLOGY 1 0 0 1

Course Objectives

- To increase vocabulary and enhance use, knowledge, and understanding of the English language.

- To stimulate an appreciation for the English language, including how it developed, how new wordsenter the language, and how it continues to be dynamic.
- To demonstrate the importance of a broad-based vocabulary for effective oral and written communication.

Programme Outcomes (POs)
Course Outcomes (COs)

1. Examine prefixes, roots, and suffixes of Latin, Greek, Germanic, and Anglo-Saxon origin.
2. Explore the historical aspects of language, including the infusion of Indo-European languages, semantic changes, and the influence of world events.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2

UNIT I **7 Hours**

CONVENTIONS

Acronyms, Abbreviations, Initialises, Jargon Neologisms - Idiomatic Expressions, Euphemisms Spoonerisms Malapropisms ; Mondegreens - Words Derived from Latin - Words Derived from Greek - Words Derived from - Germanic/Anglo-Saxon - Abstract word Acronym - Affix Analogy - Antonym Apheresis - Blend word Assimilation - Colloquial language Clipped word

UNIT II **8 Hours**

WORD ANALYSIS

Concrete word Derivative - Dialect Diminutive suffix - Dissimilation Doublet - Etymology Euphemism - Figurative word Homonym - Hybrid word Inflection - Informal language Infusion - Jargon Linguistics - Loan words Metathesis ; Modify - Philology Onomatopoeia - Romance language Prefix - Semantics - Root-base word - Suffix Slang - Word component Synonym

Total: 15 Hours

Reference(s)

1. Norman, Lewis. Word Power Made Easy, Goyal Publisher. Edition 2. 2014.
2. C T Onions. The Oxford Dictionary of English Etymology, Volume 11, Issue 1.70, Wynford Drive, Don Mills, Ont, Oxford University Press.1965.
3. Nurnberg W, Maxwell and Rosenblum, Morris, How to build a better Vocabulary, Completely Revised and Updated, Popular Library. 1961.

18GE0XB GENERAL PSYCHOLOGY 1 0 0 1

Course Objectives

- To provide a basic understanding of psychology.
- Defining Psychology and the subject matter of psychology.
- To provide an awareness of various methods and branches of psychology.
- To explain social and work psychology of people and the need for mental health.

Programme Outcomes (POs)
Course Outcomes (COs)

1. Understand the basics of human behavior in the workplace and society at large.
2. Understand the different fields of psychology and its uses.
3. Deal people effectively in their personal and social life.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2

UNIT I **7 Hours**
INTRODUCTION TO PSYCHOLOGY
Psychology - Definition - Methods and Scope of Psychology Stress: Stressors - Coping Skills - Adjustment Disorders - Acute Stress Disorders - PTSD Anxiety Disorders: Generalized Anxiety disorder Panic attack-Phobias - Obsessive Compulsive disorder (OCD).

UNIT II **8 Hours**
PSYCHOLOGICAL DISORDERS
Clinical Picture Childhood and Adolescent Disorders: Mental retardation - Autism-Learning disorders - Eating disorders -Clinical Picture Schizophrenia: Types - Clinical Pictures - Causes - Treatment;Suicide: Risk factors - Suicide prevention.

Reference(s)

1. Jeffrey E.Hecker,2005):Introduction to Clinical Psychology, New Delhi:Pearson Education.
2. Robert C Carson,James N Butcher & Susan Mineka,(2004): Abnormal Psychology and Modern Life,(11th Edition),New York: Pearson Education.
3. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J.(1993). Introduction to Psychology,7th Ed. New Dehi:Tata McGraw Hill

18GE0XC NEURO BEHAVIORAL SCIENCE **1 0 0 1**

Course Objectives

- To provide an introduction to the Cognitive Neuro Science of languages.
- To provide an understanding of the Cognitive processes.

Programme Outcomes (POs)
i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Course Outcomes (COs)

1. Identify the psychological problems that will impact mental health.
2. Value ethical conduct in professional and personal life.
3. Recognize the need for rationale and evidence in decision-making.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2

UNIT I **8 Hours**

INTRODUCTION TO PHYSIOLOGY

Introduction to physiology - Anatomy - Neuro Biology - Psycho Neuro Science.

UNIT II **7 Hours**

PSYCHOLOGICAL BEHAVIOR

Behaviour and Hormones - Behaviour Modifications - Relaxation Therapy - Psycho Education for minds.

Total: 15 Hours

Reference(s)

1. Beck. Robert. Handbook of Physiology. Vol I.
2. Horon C Philip. Sexology and Mind.

1 0 0 1

18GE0XD VISUAL MEDIA AND FILM MAKING

Course Objectives

- To acquire fundamental knowledge on development of filmmaking as an art
- To provide students a basic understanding of the techniques and nuances of visual medium
- To inculcate an ability to plan and produce a short film

Programme Outcomes (POs)

b. b. Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

f. f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Course Outcomes (COs)

1. Understand the significance and techniques of visual medium
2. Analyse and produce visual clippings

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2

UNIT I **7 Hours**

INTRODUCTION

History of Cinema (Origin and Narrative). Cinema as a visual medium - Significance of Editing. Styles of

Editing - Editing as a methodology (Hollywood"s Invisible Editing)-Technical Aspects of Editing (Final Cut Pro (FCP), AVID and Premire Pro) - Basics of video production (pre-production to post-production)

UNIT II **8 Hours**

FUNDEMENTALS OF FILMMAKING

Different types of shots and angles-Film style and Narrative-(Italian Neo-realism, Avant Garde, Russain Formalism, Alternative Cinema etc.,)- Regional Cinema to National Cinema - Basics of Script Writing (Double and Single Column)- Basics of Video Production (script to screen)- Final submission of a script for five minutes short film.

Total: 15 Hours

Reference(s)

1. Monaco, James, How to Read a Film: Movies, Media, and Beyond. Auckland: OUP, 2009.
2. Belavadi, Vasuki, Video Production. India: OUP, 2013.

18GE0XE YOGA FOR HUMAN EXCELLENCE 1 0 0 1

Course Objectives

- To know about the history and schools of yoga
- To know the difference between supreme consciousness and individual consciousness
- To apply the knowledge by the way of practice and introspection

Programme Outcomes (POs)

Course Outcomes (COs)

1. Understand the historical aspects and schools of yoga
2. Ensure their physical & mental wellness through yoga practice
3. Develop the power to concentrate and have stress free mind

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2

UNIT I **15 Hours**

YOGA FOR HUMAN EXCELLENCE

What is Yoga , History of Yoga - Yoga in todays scenario- Schools of Yoga - Eight Limbs of Yoga - Sathvic, Rajasic, Tamasic Foods and Thoughts - Science of Yoga Loosening Exercises - Yogasanas & Benefits - Super Brain Yoga - Surya Namaskar Standing Asanas - Sitting Asanas - Prone Asanas - Supine Asanas - MudrasRelaxation - Pranayama - Meditation

Total: 15 Hours

Reference(s)

1. Vethathiri Publications, Yoga Practices-2, Erode, 2012.
2. Iyengar B.K.S. Yoga: Wisdom & Practice, B.K.S. Iyengar, 2009.
3. Ramesh Partani, The Complete Secret, Ru Education, 2013.

4. http://www.sarvyoga.com/
5. http://www.wikihow.com/Do-Superbrain-Yoga

18GE0XF VEDIC MATHEMATICS 1 0 0 1

Course Objectives

- To improve their calculation speed, analytical thinking and numerical skills

Programme Outcomes (POs)
Course Outcomes (COs)

1. Solve problems creatively in mathematics and its applications

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2			1				1						

15 Hours

UNIT I

VEDIC MATHEMATICS

Addition- Subtraction- System of Multiplication- Squaring numbers- Cube roots- Square roots- Solution of simultaneous equations- Solutions of Quadratic equations

Total: 15 Hours

Reference(s)

1. Dhaval Bathia, Vedic Mathematics, JAICO Publishing House, 29th Edition, Mumbai, 2014
2. Jagadguru Swami Sri Bharathi Krsna Tirthaji Maharaja, Vedic Mathematics, Motilal Banarsidass Publishers Private Limited, New Delhi, 1997

18GE0XG HEALTH AND FITNESS 1 0 0 1

Course Objectives

- To understand the fundamental concepts about physical fitness & its types, training and assessment of physical fitness

Programme Outcomes (POs)
Course Outcomes (COs)

1. Acquire the knowledge and training of the individual physical, mental and social concepts
2. Understand the fundamental concepts of yogic practice and physical fitness
3. To acquire the knowledge about nutrition and health consciousness

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2
3	3	2		2									3	3

UNIT I **5 Hours**

FITNESS

Meaning & Definition, Need & importance of Physical fitness, Types Physical fitness - Exercise, Training and Conditioning and it is important

UNIT II **5 Hours**

YOGA AND MEDITATION

Meaning and definition; Principles of practicing;Basic Asana and it important; Pranayama and Meditation - Relaxation Techniques

UNIT III **5 Hours**

NUTRITION AND BALANCE DIET

Nutrition and Balance Diet: Needs and Important, Significant of Nutritional Food - Tips for balance diet. Common Diseases for IT professionals: Common diseases - cause prevention-First aid for common sports injuries.

Total: 15 Hours

Reference(s)

1. Anderson, Bob., Pearl, Bill.,&Burke, Edmund R., (2001). Getting in Shape Workout Programs for Men&Women. Mumbai: Jaico Publishing House
2. Baechle, Thomas. R, & Earle, Roger. W., (2000). Essentials of Strength Training and Conditioning. Champaign: Human Kinetics
3. Iyengar, BKS., (2003). The Art of Yoga. New Delhi: Harper Collins Publishers
4. Singh, Hardayal, (1995). Science of Sports training. New Delhi: D.V.S. Publications

18GE0XI BLOG WRITING 1 0 0 1

Course Objectives

- To sharpen and improve writing skills, including draft writing, voice, and format.
- To develop general and global knowledge.
- To experiment with non-written forms of online communications, including images, audio and video.
- To be able to add content to your website without the assistance of a web designer.

Programme Outcomes (POs)

f. f. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

g. g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

j. j. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Course Outcomes (COs)

1. Understand the flow of language in natural manner.
2. Understand the elements of a blog and be able to use them effectively.
3. Find a niche for a long-term blog.

4. Gain insight into the strategies, methods and writing of successful bloggers.
5. Develop their creative thinking.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1		1			2									
2			1		2									

UNIT I **7 Hours**

CONCEPT

Concept: What is blog writing? Types of blog posts -personal experience, opinion, reviews, advice, news/updates. Focusing your blog - concept, audience, uniqueness, posts. Company blogs. Structure: Types of structure - inverted pyramid, feature article, list, story, other options. Creating effective openings. Planning a post.

UNIT II **8 Hours**

VOICE RELIABILITY

Voice: Defining and achieving voice. Exploring various voices. Stylistic tipsÃƒÂ¢??rhythm, verbs, interesting words, senses, emphasis. Smartness and sarcasm. Reliability - accuracy, provability, specificity. Transparency about payments. Sample Blogs and Activities

Total: 15 Hours

Reference(s)

1. The Elements of Blogging: Expanding the Conversation of Journalism, by Mark Leccese and Jerry Lanson. (Taylor & Francis, 2015) ISBN: 978-1-13-802154-9. $29.95 paperback.
2. Blogging Heroes, by Michael Banks. Choose 15 of the 30 interviews/profile segments to read, be sure to include the segments on Chris Anderson and Brian Lam.
3. Complete Guide to Blogging, Huffinghton Post

18GE0XJ INTERPERSONAL SKILLS 1 0 0 1

Course Objectives

- To communicate and work effectively, both individually and in groups
- To be able to understand and manage ones own and others emotions
- To define and solve problems by making decisions about the best course of action

Programme Outcomes (POs)

Course Outcomes (COs)

1. Express themselves clearly and confidently
2. Listen to others completely and with empathy
3. Assert an opinion without diminishing others opinion
4. Be responsible and timely with a willingness to collaborate
5. Develop innate personality traits to handle certain social situations

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1		2			1									
2		2					1							

UNIT I **7 Hours**

INTRODUCTION

Conversational Skills - Active Listening - Team working Empathy - Emotional Intelligence

UNIT II **8 Hours**

SKILLS

Conflict Resolution and Mediation skills - Decision making and Problem Solving - Negotiation and Persuasion skills

Total: 15 Hours

Reference(s)

1. Stephen P. Robbins, Phillip L. Hunsaker, Training in Interpersonal Skills, Pearson, 2015
2. Robert B. Cialdini, Influence: The Psychology of Persuasion, Harper Business; Revised Edition, 2006
3. Suzanne C De Janasz, Karen O Dowo & Beth Z Schneder, Interpersonal Skills in Organisations, McGraw-Hill Education; 5th Edition, 2014

18GE0XK NEW AGE INNOVATION AND ENTREPRENEURSHIP

1 0 0 1

Course Objectives

- Understand the role of National Service Scheme in community
- Identify the needs and problems of the community and involve in problem solving
- Develop competence required for group living and acquire leadership qualities

Programme Outcomes (POs)

Course Outcomes (COs)

1. understand the community in which they work and render their service
2. develop among themselves a sense of social and civic responsibility

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1							2		2					
2							2		2					

UNIT I **8 Hours**

INTRODUCTION TO NSS

History - philosophy - aims and objectives of NSS - Emblem, flag, motto, song, badge - Organizational structure - roles and responsibilities. NSS Programmes and Activities: Concept of regular activities, special camping, Day

Camps - Basis of adoption of village/slums - Methodology of conducting Survey - Financial pattern of the scheme - Coordination with different agencies - Maintenance of the Diary. Entrepreneurship Development: Definition and Meaning - Qualities of good entrepreneur - Steps/ways in opening an enterprise - Role of financial and support service Institutions

UNIT II **7 Hours**

COMMUNITY MOBILISATION

Mapping of community stake holders - Designing the message in context of the problem and the culture of the community - Identifying methods of mobilization - Youth-adult partnership. Health, Hygiene and Sanitation: Definition, needs and scope of health education - Food and Nutrition - Safe drinking water, water borne diseases and sanitation (Swachh Bharat Abhiyan)

FIELD ACTIVITY

NSS volunteers will contribute 240 hours of voluntary service and attend one special camp as prescribed in NSS Calendar

Total: 15 Hours

Reference(s)

1. A Hand book on National Service Scheme, Anna University, Chennai, 2012
2. http://nss.nic.in/intro.asp
3. Delgado-Gaitn and Concha, The Power of Community: Mobilizing for Family and SchoolingNew York: Rowman & Littlefield Publishing, Inc. 2001
4. James Bailey,Guide to Hygiene and Sanitation in Aviation, World health organization, 2nd edition. 1980
5. AnuradhaBasu, Mark Casson, Nigel wadeson and Bernard Yeung, The oxford hand book of entrepreneurship, Oxford Press. 2009

18GE0XL NATIONAL CADET CORPS 1 0 0 1

Course Objectives

- To understand the importance of NCC and its organization.
- To realize the skills in the applications of drill and weapon training.
- To analyze the factors in National unity
- To identify the utility of smart materials in engineering applications.

Programme Outcomes (POs)

g. g. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Course Outcomes (COs)

1. Recall the motto and aim of NCC.

2. Implement synergy in disaster management.
3. Execute an example patriotic leader to serve nation

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1											
2	3	2											2	2

UNIT I **7 Hours**

NCC STRUCTURE AND TRAINING

NCC ORGANIZATION

National Cadet Corps: Aim and Objectives - Administrative and Organizational pattern - NCC flag and NCC song - Duties, Responsibilities and Conduct by NCC Cadets - Badges of ranks in NCC and Armed forces- Types of NCC camps - Eligibility conditions for writing B and C certificate examinations. Cadet welfare society and Career opportunities for NCC cadets.

DRILL AND WEAPON TRAINING

Drill: Aims of drill - Types of drill - Foot drill, Arms drill and Ceremonial drill. Word of commands, Guard of honour. Weapon training - Rifles used in NCC: Parts and Characteristics of 0.22 and INSAS - Stripping, Assembling and Cleaning of weapons.

NATIONAL INTEGRATION AND SOCIAL AWARENESS

National Integration: Introduction - Constitution of India- Importance and Necessity - Factors affecting National integration - Role of NCC in National integration. Social service and its need - Rural development programs - NGOs role and Contribution - Social Security schemes.

UNIT II **8 Hours**

PERSONALITY DEVELOPMENT AND LEADERSHIP

PERSONALITY DEVELOPMENT AND LEADERSHIP

Personality Development: Introduction - Factor influences in personality development. Leadership: Leadership traits and Skills - Indicator of good leader - Honour code concept - Type of leaders - Case studies of effective leader.

DISASTER MANAGEMENT AND FIRST AID

Disaster types - Natural and Manmade disasters. Role of NCC cadets in disaster management. Civil defence: Civil defence measures - Civil defence services. First aid: First aid kits and Equipments - First aid for snake bite, Sun stroke and Drowning - Respiration -Types of respiration.

Total: 15 Hours

Reference(s)

1. Cadets Hand book Common subject, DG NCC, New Delhi.
2. Cadets Hand book Special subject, DG NCC, New Delhi
3. Misra R.C and Sanjaykumar Mishra, A HAND BOOK OF NCC(English), Kanti Prakashan, 2016
4. Gupta R. K, NCC: Handbook of NCC Cadets for A, B and C Certificate Examinations (English) RPH Editorial Board, 2018.

18GE0XO SOCIAL PSYCHOLOGY 1 0 0 1

Course Objectives

- To provide a basic understanding of social psychology.
- Defining psychological & physical changes during puberty age.
- To provide an awareness of various psychological problems and social problems.
- To explain social and work psychology of people and the need for mental health.

Programme Outcomes (POs)

i. i. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Course Outcomes (COs)

1. Understand the basics of human behavior in the workplace and society at large
2. Understand the various psychological, physical, social problems and management skills.
3. Deal people effectively in their personal and social life.

Articulation Matrix

CO No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1														
2														
3				3										

UNIT I **7 Hours**

INTRODUCTION

Introduction - Ice breaker - Time Line - Tasks and Challenges of the age(Erik Erikson)Physical changes - Introduction to Reproductive Health - Reproductive Organs - Menstruation - Changes during Puberty - Abortions - Contraception - Difference between Sex and Gender - Introduction to the origins of Patriarchy - Gender.

UNIT II **8 Hours**

PSYCHOLOGY

Developmental changes - Attraction - Friendship - Differences and Similarities - Images of Beauty and Body Image -Introduction to Media-Feedback - Sexuality - Boundaries Relationships - Marriage - Love - Emotional Health - Sexual Abuse and Safety - Role of Media - Abortions, Contraception, Wrapping up the Course.

Total: 15 Hours

Reference(s)

1. Baron, R. A.,Branscombe.N.R.(2016).Social Psychology,14th Ed. New Delhi;Pearson Education
2. Morgan,C.T., King,R.A.,Weisz,J.R.,&Schopler,J.(1993). Introduction to Psychology,7th Ed.New Dehi:Tata McGraw Hill.