

KIT - Kalaignarkarunanidhi Institute of Technology

(An Autonomous Institution)

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai Accredited by NAAC with 'A' GRADE & NBA (AERO, CSE, ECE, EEE, MECH & MBA) An ISO 9001 : 2015 Certified Institution

Coimbatore - 641 402.

REGULATIONS, CURRICULUM & SYLLABUS - 2023

(For Students admitted from the Academic Year 2023-24 and onwards)

BACHELOR OF ENGINEERING DEGREE IN

AERONAUTICAL ENGINEERING



DEPARTMENT OF AERONAUTICAL ENGINEERING

Vision and Mission of the Department

Vision

+ To promote high quality in technical education with relevant research in the field of Aeronautical engineering to bring out skilled and employable professionals for the upliftment of society.

Mission			
+	To provide competent education in the domain of Aeronautical engineering.		
+	To impart professional and ethical responsibilities, leadership and entrepreneurship qualities for the student's career development.		
+	To cultivate the state of art research facilities to analyze and evaluate new fields of Aeronautical engineering and impart societal responsibilities among the students.		
+	To collaborate with industries and professional bodies to mould the students as competent industry ready professionals.		

Program Educational Objectives (PEO's)

PEO 1	Graduates will have the ability to apply knowledge across the disciplines and in emerging areas of Aeronautical engineering with sound technical expertise to solve competitive problems of real world challenges
PEO 2	Graduates will apply their analyzing, design and manufacturing skills in Aeronautical engineering and technology for the upliftment of social well being of the nation.
PEO 3	Graduates will be competitive professionals in aeronautical industries by adopting life-long learning and quality management practices for the betterment of society and individual.

Programme Outcomes (PO's)				
	Students graduating from Aeronautical Engineering should be able to			
PO 1	Engineering Knowledge : Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
PO 2	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.			
PO 3	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.			

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PO 4	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.		
PO 5	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.		
PO 6	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.		
PO 7	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.		
PO 8	Ethics : Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.		
PO 9	Individual and Team Work : Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.		
PO 10	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.		
PO 11	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.		
PO 12	Lifelong 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 Specific Outcome (PSO's)			
Graduates of Aeronautical Engineering Programme should be able to			
PSO 1	Apply the principles of Aeronautical engineering to solve engineering problems by utilizing advanced technology in the field of aerodynamics, structures, propulsion and maintenance.		

Analyze and design the manufacturing and management practices for the betterment of society

and individual to become a competitive professional in Aeronautical field.

PSO 2

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Programme Coordinator

UG Regulations

– KIT - Kalaignarkarunanidhi Institute of Technology

1. SHORT TITLE AND COMMENCEMENT

- O These Regulations shall be called the "KIT-Kalaignarkaraunanidhi Institute of Technology, Coimbatore, Regulations for the Award of B.E. / B.Tech., Degree".
- They have been evolved, drafted and implemented after deliberations in and approvals from UGC, Anna University and Academic Council of the Institute, and are subject to changes/ modifications from time to time; (major modifications at a frequency of FOUR years in synchronization with the curriculum structure revision and minor changes as and when applicable).
- () The latest / first version shall be applicable for the students enrolling for B.E. / B.Tech degree programme at this Institution from the Academic year 2023-24 and onwards.
- The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of students (including those already undergoing the programme) as may be decided by the Academic Council.

2. PREAMBLE

The regulations prescribed herein have been made by KIT, an autonomous institution, approved by AICTE,New Delhi and affiliated to the Anna University, Chennai, to facilitate the smooth and orderly conduct of its academic programmes and activities at the B.E/B.Tech., level. It is expected that the regulations will enable the students to take advantage of the various academic opportunities at the Institute and prepare themselves to face the challenges in their professional careers ahead. It may be noted that :

- a. The provision made herein shall be applicable to all the B.E/ B.Tech. programmes offered at the institution, at present.
- b. They shall also be applicable to all the new B.E /B.Tech. programmes which may be started in the future.
- c. Academic and non-academic requirements prescribed by the Academic Council have to be fulfilled by a student for eligibility towards award of B.E. / B.Tech. Degree.

3. PRELIMINARY DEFINITIONS AND NOMENCLATURE

In this Regulations, unless the context otherwise requires :

SI.No.	Name	Definition
1.	ProgrammeRefers to Degree Programme that is B.E. / B.Tech.	
2.	Branch	Refers to branch or specialization of B.E. / B.Tech. Programme, like Computer Science and Engineering, Mechanical Engineering, etc.,
3.	Course	Refers to a theory or practical subject that is normally studied in a semester, like Mathematics, Physics, etc.,

Table - 1 : Preliminary Definitions and Nomenclature

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4.	Principal / Head of the Institution	Refers to the authority of the institution who is responsible for all academic activities, for the implementation of relevant rules and regulations.	
5.	Controller of Examinations (CoE)	Refers to the authority of the college who is responsible for all activities of the Examinations.	
6.	Head of the Department (HoD)	Refers to the Head of the Department concerned.	
7.	University	Refers to Anna University, Chennai	
8.	KIT Refers to KIT-Kalaignarkarunanidhi Institute of Tech Coimbatore. Coimbatore.		
9.	CurriculumRefers to the various components / courses studied in programme that provide appropriate outcomes (knowl skill and behavior / attitude) in the chosen branch of a		
10.	L - T - P - C Refers to Lecture, Tutorial, Practical and Credits respec		
11.	Programme Coordinator	Refers to the coordinator of the programme concerned. He / she acts as interface between programme and key stakeholders, students, faculty and employer. He/She is responsible for planning the academic activities of the programme along with the course coordinator(s) and the HoD. He/She also prepares, evaluates and analyses the attainment of the programme outcomes along with Programme Advisory Committee.	
12.	Faculty Advisor	The Faculty Advisor is responsible for providing general advice on the Academic matters, monitor the attendance and academic performance of the students and counsel them periodically. If necessary, the Faculty Advisor may also inform the parents about the progress/ performance of the students concerned through HoD.	
13.	Course Coordinator	Course Coordinator is responsible for teaching the course, evaluating and analysing the performance of the students. The students is also responsible for the assessment of the Course Outcomes / Program Outcomes / Program Specific Outcomes. They can also recommend to organize workshops / seminars/guest lectures / industrial visits to meet the Course Outcomes and Program Outcomes.	

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14.	Class committee for each semester of a progratic comprises of HoD, Programme Coordinator, Fat Advisor, Course Coordinators (as applicable) and Stur Representatives.		
15.	Academic Evaluation Committee (AEC)	ic EvaluationThe committee includes Principal, CoE, HoD concerned(For details refer Appendix V)	
16.	Department Evaluation Committee (DEC)	ionThe committee included HoD (need basis), senior faculty member(s) of department from various levels, class advisor, Mentor of the students. (For details refer Appendix V)	
17.	CIA	Refers to Continuous Internal Assessment.	
18.	ESE	Refers to End Semester Examination	
19.	CBCS CBCS CBCS CBCS		
20.	GPA	Refers to Grade Point Average	
21.	CGPA	Refers to Cumulative Grade Point Average	
22.	CEC	Refers to Career Enhancement Courses	
23.	PCC	Refers to Professional Certificate Courses	
24.	VAC	Refers to Value Added Courses	

4. ADMISSION

4.1 B.E. / B.Tech. Degree Programme (I Semester)

The Candidates should have passed the Higher Secondary Examinations of (10+2) Curriculum (Academic Stream) prescribed by the Government of Tamil Nadu with Mathematics, Physics and Chemistry as three of the four subjects of study under Part-III or any examination of any other University or authority accepted by the Syndicate of Anna University as equivalent thereto.

(OR)

Should have passed the Higher Secondary Examination of Vocational stream (Vocational groups in Engineering / Technology) as prescribed by the Government of Tamil Nadu.

4.2 Lateral Entry Admission

The candidates who possessed the Diploma in Engineering / Technology awarded by the State Board of Technical Education, TamilNadu or its equivalent are eligible to apply for Lateral

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entry admission to the third semester of B.E. / B.Tech., as per the rules fixed by Government of TamilNadu.

(OR)

The candidates who possess the Degree in Science (B.Sc.,) (10+2+3 stream) with Mathematics as a subject at the B.Sc. Level are eligible to apply for Lateral entry admission to the third semester of B.E. / B.Tech. Such candidates may be two additional Engineering subject(s) in the third and fourth semesters as prescribed by the AEC, if necessary.

4.3 Re - admission

Students, who have discontinued for reasons other than disciplinary action, may be readmitted as per guidelines given by DoTE, Government of Tamil Nadu and Anna University. DEC shall study and recommend on the exception and addition of courses to be registered for, by the student concerned during re-admission. The details shall be forward to AEC for approval and the committee's decision shall be final.

The eligibility criteria shall be as prescribed by Anna University, Chennai and Government of Tamil Nadu from time to time.

5. PROGRAMMES OFFERED

5.1 A student may be offered admission to any one of the branches of study approved by the Authorities. Degree programme affiliated to Anna University, under CBCS for students admitted from 2023 onwards in the following branches of Engineering and Technology as in Table 1.

B.E.	B.Tech		
Aeronautical Engineering	Agricultural Engineering		
Biomedical Engineering	Artificial Intelligence and Data Science		
Computer Science and Engineering	Bio Technology		
Electronics and Communication Engineering	Computer Science and Business Systems		
Electrical and Electronics Engineering			
Mechanical Engineering			
Computer Science and Engineering (Artificial Intelligence and Machine Learning)			

Table 1. List of B.E. / B.Tech. programmes offered

5.2 In addition to the regular four years B.E./B.Tech programmes, the following are offered by the Institution :

5.2.1 B.E. / B.Tech with Honors

Students can earn, BE/BTech degree with honors in the chosen discipline of Engineering by opting for six additional courses across the list of professional electives / verticals offered by their parent department.

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5.2.2 B.E. / B.Tech Honors (with specialization)

Students can earn, B.E. / B.Tech degree, honors (with specialization) in the chosen discipline of Engineering by opting for six additional courses from one of the verticals offered by their parent department.

5.2.3 B.E. / B.Tech with minor degree

Students who are desirous of pursuing their special interest areas other than the chosen discipline of Engineering can earn, B.E. / B.Tech with minor degree by opting for six additional courses from one of the verticals offered by the department other than their parent Department.

6. ACADEMIC STRUCTURE OF PROGRAMMES

6.1 Medium of Instruction

The medium of instruction for the entire programme will be English.

6.2 Categorization of Courses

The B.E / B.Tech programmes shall have a curriculum with syllabi comprising of theory, theory cum practical, practical courses in each semester, professional skills training/industrial training, project work, soft skills, internship, etc., that have been approved by the respective Board of Studies and Academic Council of the College. All the programmes have well defined Programme Outcomes (PO), Programme Specific Outcomes (PSO) and Programme Educational Objectives (PEOs) as per Outcome Based Education (OBE). The content of each course is designed based on the Course Outcomes (CO). The courses shall be categorized as follows :

- i. Humanities and Social Sciences including Management (HSMC) Courses include Technical English, Communication skills, Humanities and Management.
- ii. Basic Sciences (BS) Courses include Mathematics, Physics, Chemistry, etc.
- **iii.** Engineering Sciences (ES) Courses include Engineering Practices, Engineering Graphics, Basics of Electrical / Electronics / Mechanical / Computer, etc.
- iv. **Professional Core (PC)** Courses include the core courses relevant to the chosen specialization/branch of study.
- v. **Professional Elective (PE)** Courses include the elective courses relevant to the chosen specialization/ branch of study.
- vi. Open Elective (OE) Electives from other technical and/or emerging courses are given as a separate list of Elective Courses offered by the Engineering / Science Departments and a student can choose a Course as Open Elective from the above list of Courses.
- vii. Career Enhancement Courses (CEC) include Project, Industrial Training / Practical Training/ Internship/ Summer Projects / Seminars /Professional Practices /Case Study, Value added courses.
- viii. Mandatory Courses (MC) include Environmental Science and Engineering, Induction Programme, Constitution of India, Essence of Indian traditional language.

*Minor variations are allowed as per the need of the respective discipline.

6.3 Curriculum

The curriculum will comprise courses of study as given in respective department in accordance with the prescribed syllabi. The hours / week listed in syllabus for each of the course refer to periods/week. The curriculum consists of (a) Basic Sciences, (b) Humanities and Social sciences (c) Engineering Sciences (d) Professional cores (e) Professional electives (f) Open electives (g) Employability Enhancement courses (h) Mandatory courses and (i) Induction programme and as per AICTE guidelines.

6.4 Electives

Every student shall opt for electives from the list of electives of the respective degree programme in consultation with the Tutor, Programme Co- ordinator and the HoD. A student shall undergo two open elective courses and six professional elective courses. Professional electives will be offered from 5th semester to 8th semester. Minimum number of credits to be earned for open elective courses is 6. Minimum number of credits to be earned for professional elective courses is 18. Open electives are the elective courses offered by a department for students of other branches and professional electives are courses offered by a department to the students of their own branches only.

6.5 Project Work

Every student shall be required to undertake a suitable project in industry / research organization / department in consultation with the Head of the Department and the faculty guide and submit the project report thereon at the end of the semester in which the student registered, on date announced by the College / Department. A student shall register for the Project Work I in the 7th semester and for Project Work II in the 8th semester.

6.6 Induction Programme

All students shall undergo induction programme in the first semester for a duration of three weeks as per the guidelines of All India Council for Technical Education (AICTE). A student completing the induction programme will be awarded completed grade and only the students who complete the induction programme shall be considered as eligible for award of degree subject to satisfying other conditions. A student who does not complete the induction programme in the first semester shall Redo the same in the subsequent semesters.

6.7 Number of credits per semester

Curriculum of a semester shall normally have a blend of theory Courses and practical Courses. In addition, Career Enhancement Course(s) may also be included. Each course may have credits assigned as per clause 5.8. However, the total number of credits per semester shall not exceed 36 (including CEC, credit transfer from SWAYAM/NPTEL courses, re-registration courses, courses registered for honors/honors with specialization/minor degree, and excluding Value Added courses, reappearance courses).

6.8 Credit Assignment

Each course offered is given a L-T-P-C structure, depending on the number of Lecture (L), number of periods for Tutorial periods (T), number of periods for practical (P), C- credits required for an efficient teaching – learning process. A student is expected to put-in his / her

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own efforts in proportion with periods spent in classroom, as defined in L-T-P-C structure. On successful completion of the course a student is said to have earned a specified number of credits defined for each course. Each course is assigned certain number of credits based on the following table :

Contact period per week	Credits	
1 Lecture (L)	1	
1 Tutorial Period (T)	1	
1 Practical Period (P)	1/2	
(Laboratory Periods / CEC / Projects)		

Table 2 : Credit Assigned

6.9 CAREER ENHANCEMENT COURSES (CEC)

6.9.1 Industrial Training / Practical Training/ Internship/ Summer Projects / Seminars / Professional Practices / Case Study.

The students may undergo industrial training/Internship if mandated in the curriculum for periods as specified in the curriculum during the summer/winter vacation, the training being taken on a continuous basis for the periods mentioned. The industry / organization is to be selected with the approval of the Department Evaluation Committee (DEC). The students may undergo Internship at a Research organization / University/ Industry (after due approval from the Head of the Institution) for the period prescribed in the curriculum during the summer / winter vacation, in lieu of Industrial training

The Industrial training/ Practical Training/ Internship/ Summer Projects / Seminars / Professional Practices / Case Study which is successfully completed by the student in a particular semester during the course of study is eligible for including in the grade sheet in the immediate next semester by registering it. The final year project period at industry / research organization will not be considered as industrial Training/internship.

6.9.2 Industrial Visit

Every student is required to go for at least one Industrial visit every year starting from the second year of the Programme subject to the approval of the Head of the Department and Principal. The Heads of Departments shall ensure that necessary arrangements are made in this regard.

6.9.3 Professional Certificate Courses

Students have to undergo one credit courses offered by experts from industry / research organizations and approved by academic council. Students can register such courses from his/her second year of study as and when these courses are conducted by the Departments. A student can also permitted to register for these courses of other Departments.

If a student does not successfully complete the registered industry supported one credit courses in a semester, the registration of that course will be considered as withdrawn. Further, it will not be treated as arrear and if he / she wishes, he/she can re-register for the same course in the ensuing semesters and successfully complete it as and when it is offered subsequently.

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6.9.4 Online Courses offered through SWAYAM / NPTEL

Students may be permitted to register maximum of two online courses, subject to a maximum of six credits, registered through SWAYAM instead of Professional/Open Elective Courses (For Honors / Honors with Specialization / Minor degree, additional two SWAYAM / NPTEL online courses with 3 credits each, are permitted for credit transfer) of regular B.E/B. Tech Programme with the approval of BOS through DEC. The online course of minimum 3 credits can be considered instead of one Professional / Open elective course.

DEC finalizes the courses to be permitted for credit transfer through SWAYAM / NPTEL prior to the commencement of the semester. The courses selected through the SWAYAM/ NPTEL may not be necessarily the courses which are offered in the list of Professional/Open Elective courses, as part of the curriculum.

The Committee also intimates the students about the selected courses prior to the commencement of the semester, identify and designate a Course Coordinator for the online course(s) offered. The Course Coordinator guides the students throughout the course, submits the certificates and marks earned by the students to the office of the CoE during credit transfer request by the student.

The student has to register for the credit transfer of the online course during the course registration. The online course(s) which is/are successfully completed by the student in a particular semester during the course of study is eligible for credit transfer in the immediate next semester by registering it (i.e. an online course is eligible for credit transfer in the immediate next semester only)

6.9.5 Soft Skills

Every Student is required to go for soft skill courses during first year of study. The soft skill course includes the communication skill, interpersonal skill and career development courses, etc. (Non Credit).

6.9.6 Value added courses

Value added courses shall be offered by the Department with the prior approval from BoS. The credits earned through value added course shall be over and above the total credit requirement prescribed in the curriculum for the award of degree. Students can earn maximum of six credits from a value added courses subject to maximum of one value added course per semester. The permitted credit structure for a value added course is 3. Industry offered and skill development courses shall be considered under this category. These value added courses can also be undergone through online platform approved by the Board of Studies through DEC. The course(s) (if pursued through online mode) which is/are successfully completed by the student in a particular semester during the course of study is eligible for including in the grade sheet in the immediate next semester by registering it.

Students may be permitted to register maximum of one value added course, subject to the maximum of three credits registered through, value added course.

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Instead of one professional /open elective courses of regular B.E/B.Tech. programme with the approval of Bos through DEC. The value added course of minimum 3 credits can be considered instead of one professional /open elective course.

6.9.7 Course Numbering Scheme

Each course is denoted by a unique code consisting of 9 alphanumeric characters. The details of the numbering scheme are in APPENDIX A.

6.9.8 Credit Requirement for Programmes

The total number of credits that a student earns during the period of study is called the total credits. For the successful completion of the B.E/B.Tech Programme, a regular student must earn 169 credits (varies with the programme) in minimum of eight semesters, while a lateral-entry student must earn 127 credits in a minimum of six semesters.

7. DURATION OF THE PROGRAMMES

A student is normally expected to complete the B.E / B.Tech. Programme in 4 years i.e 8 semesters, but in any case (including authorized break of study on one year) not more than 7 years i.e. 14 Semesters (vide clause 18).

A Lateral entry student is normally expected to complete the B.E. / B.Tech programme in 3 years (6 semesters), but in any case (including authorized break of study of one year) not more than 6 years i.e. 12 semesters. The duration of B.E. / B.Tech programme for a lateral entry student shall be three academic years with semester pattern. The courses of study for the lateral entry Diploma candidates shall be in accordance with the prescribed syllabus of third to eighth semesters of the full time four year B.E. / B.Tech. Degree Programme of the respective branches. The courses of study for the lateral entry science graduates shall be in accordance with the prescribed syllabus of the prescribed syllabi of the full time four year B.E. / B.Tech. Degree programme of the respective branches. The additional courses offered will be decided by the respective Chairman, Board of Studies.

Each semester normally consists of 90 working days, including test or 450 hours or 540 periods of each 50 minutes duration. The HOD shall ensure that every course coordinator imparts instruction as per the number of contact periods specified in the syllabus covering the full content of the syllabus for the course being taught.

The total duration for completion of the programme reckoned from the commencement of the first semester to which the student was admitted shall not exceed the maximum duration specified

Due to Pandemic / Abnormal situations the Scheme of Examinations and Evaluation will be followed as per the guidelines issued by the Government of Tamil Nadu and Anna University, Chennai.

The total period for completion of the programme reckoned from the commencement of the first semester to which the candidate was admitted shall not exceed the maximum period specified in this clause irrespective of the period of break of study in order that he/she may be eligible for the award of the degree

For the purpose of regulations, the academic year will be divided into two semesters, the odd semester normally spanning from June to November and the even semester from December to May.

8. COURSE REGISTRATION

Each student, on admission shall be assigned to a Faculty Advisor, who shall advice and counsel the student about the details of the academic programme and the choice of courses considering the student's academic background and career objectives.

In the first semester of study, each student on admission shall register for all the courses prescribed for the first semester in the curriculum.

From the first semester onwards, every student shall enroll for all the courses of the next Semester in the current Semester itself. The enrollment for all the courses of the next semester will commence 10 working days prior to the last working day of the current Semester.

From second semester onwards, the student shall confirm the enrollment by registering for the courses within the first ten working days after the publication of results including revaluation results of the previous semester examinations. However, the student has to register for the courses for which the student has not enrolled, if these are the courses in which the student has failed.

The registration process for the courses offered in the online registration mode in the forthcoming semester, will commence preferably 10 working days prior to the last working day of the current semester.

A department shall offer a course only if a minimum of 10 students register for that course. This minimum number may vary from course to course and shall be specified by the department from time to time.

Students who rejoined the programme after availing permitted Break of Study or Readmitted by DOTE / University need not submit new Enrollment Form, but they have to submit the course registration form. The Transfer and Lateral Entry Students who joined the programme in a particular semester have to submit the course registration form within the first 10 working days after the date of joining.

After registering for a course, a student shall attend the classes, satisfy the attendance requirements, earn Continuous Internal Assessment Marks and appear for the End Semester Examination (ESE) or as specified in the curriculum.

8.1 Credit details for Course Registration

A student has to earn the total credits specified in the curriculum of the respective programme of study, in order to be eligible to obtain the degree. However, if the student wishes, then he/she is permitted to earn more than the total number of credits prescribed in the curriculum.

The number of credits, most students are expected to register for, in a semester, will be about 20 - 30 credits (excluding arrears). so that they complete the programme within the specified duration of the programme. The minimum credits a student can register for, in a regular semester shall be 12 and the maximum credit a student can register is 36 (excluding arrears). Students shall register for project work in the 7th and 8th semester or 8th semester only.

Table	4:	Credit	Range
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PROGRAMME	PRESCRIBED CREDIT RANGE
B.E. / B.Tech. (Regular)	169
B.E. / B.Tech. (Lateral Entry)	127
B.E. / B.TECH (Honours)	(169 / 127) + 18 Credits

8.2 Flexibility to Add / Drop courses

- **8.2.1** 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, he / she is permitted to earn more than the total number of credits prescribed in the curriculum of the Programme.
- **8.2.2** The students shall undergo the eighth semester courses other than the Project Work in the sixth and seventh semesters, provided they do not have current arrears and have a CGPA of 7.50 and above at the end of Semester IV. The Faculty Advisor, HoD, in consultation with the faculty handling the said courses shall forward the proposal to the CoE for approval at least 4 weeks before the commencement of the sixth semester of the programme. Total numbers of credits of such courses shall not exceed 3.
- 8.2.3 The students should not have standing arrears and have a CGPA of 7.50 and above for registering additional courses. However, the maximum number of credits the student can register in a particular semester cannot exceed 36 credits (Including the CEC, credit transfer from SWAYAM/ NPTEL courses, Re-registration courses, course registered for Honors/Honors with Specialization/ Minor degree and Excluding the courses for which the student has done reappearance registration, value added courses).
- 8.2.4 From the second to final semesters, the student has the option of dropping existing theory courses in a semester during registration. The total number of credits of such courses shall not exceed 6 per semester. The student is permitted to drop the course(s) within 30 days of the commencement of the academic schedule.

8.3 Reappearance Registration / Re-enrollment Registration

- 8.3.1 If a student fails in a Theory (except electives) / Theory with Practical component/ Practical course(s), the student shall do reappearance registration for that course in the subsequent semester and attend end semester examination.
- 8.3.2 If the theory course, in which the student has failed, is a Professional Elective or an Open Elective course, the student may register for the same or any other Professional Elective or Open Elective Course respectively in the subsequent semesters. Such changes can be done only with due approval by the HoD.
- **8.3.3** The student who fails in Project work shall register for the same in the subsequent semester, satisfy attendance requirement, earn continuous assessment marks and appear for the ESE.

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- **8.3.4** If a student is prevented from writing ESE due to lack of attendance (overall attendance is below 65%), the student has to rejoin the programme in the next academic year after getting readmission order from DOTE/University. The student shall attend the classes and fulfil the attendance requirements as per clause 8, earn continuous assessment marks and appear for the ESE.
- 8.3.5 B.E. / B. Tech. (Honours) Specialisation in the same discipline, B.E. / B. Tech. (Hons) and B.E. / B. Tech. minor in other specialization
 - i. B.E. / B.Tech. Honours (Specialisation in the same discipline) :
 - a. The student should have earned additionally a minimum of 18 credits from a vertical of the same programme.
 - b. Should have passed all the courses in the first attempt.
 - c. Should have earned a minimum CGPA of 7.50.
 - ii. B.E / B.Tech. Honours
 - The students should have earned additional courses (minimum of 18 credits) from more than one vertical of the same programme.
 - b. Should have passed all the courses in the first attempt.
 - c. Should have earned a minimum CGPA of 7.50.
 - iii. B.E. / B.Tech. (Minor in other specialisation)

The student should have earned additionally a minimum of 18 credits in any one of the verticals of other B.E/B.Tech programmes.

Students can earn maximum of 6 credits in online mode (SWAYAM platform), out of these 18 credits as approved by Board of Studies

B.E. / B. Tech. (Hons) Specialization in the same discipline, B.E / B.Tech. Honors and B.E. / B.Tech. minor in other specialization degree will be optional for students.

For the categories 6.10.1 (i) to 6.10.1(ii), the students will be permitted to register the courses from V Semester onwards provided the marks earned by the students until III semester should be of CGPA 7.50 and above and cleared all the courses in the first attempt.

For the category 6.10.1 (iii), the students will be permitted to register the courses from Semester V onwards provided the marks earned by the students until Semester III is CGPA 7.50 and above

If a student decides not to opt for Honours, after completing certain number of additional courses, the additional courses studied shall be considered instead of the Professional Elective courses which are part of the curriculum. If the student has studied more number of such courses than the number of Professional Elective courses required as per the curriculum, the courses with higher grades shall be considered for the calculation of CGPA. Remaining courses shall be printed in the grade sheet, however, they will not be considered for calculation of CGPA

If a student decides not to opt for Minor, after completing certain number of courses, the additional courses studied shall be considered instead of Open Elective courses which are part of the curriculum. If the student has studied more number of such courses than the

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number of open electives required as per the curriculum, the courses with higher grades shall be considered for calculation of CGPA. Remaining courses shall be printed in the grade sheet. However, they will not be considered for calculation of CGPA.

9. REQUIREMENTS FOR APPEARING FOR CIA, ESE

9.1 A student who has fulfilled the following conditions shall be deemed to be eligible to appear for the CIA - I, CIA - II, CIA - III and ESE. Ideally, every student is expected to attend all the classes and earn 100% attendance. Students who have earned not less than 75% attendance course wise taking into account the number of periods required for that course as specified in the curriculum. Table 5 illustrates the mandatory attendance requirement for CIA - I, CIA - II, CIA - I

Test / Examination Type	Period of Calculation	Minimum % of attendance required
CIA - I	First Semester From the date of joining of course to three working days before the start of CIA – I	60%
CELLEN	Second to Eighth semester From the date of commencement of the class to one week before the start of CIA - IATORE	75%
CIA - II	From the date of joining	75%
7	(1 st semester) / date of	(for students maintaining 80%
	commencement of class	or more attendance between
	(2 nd to 8 th Semester) to one week	CIA - I and CIA - II, but falls
	before the start of CIA - II	short of the 75% cumulative
		requirement, the requirement
		may be relaxed if recommended
		by the AEC)
CIA - III	From the date of joining	75%
	(1 st semester) / date of	(for students maintaining 80%
	commencement of class	or more attendance between
	(2 nd to 8 th Semester) to one week	CIA - II and CIA - III, but falls
	before the start of CIA - III	short of the 75% cumulative
		requirement, the requirement
		may be relaxed if recommended
		by the AEC)

Table 4 : Mandatory Attendance Requirement for CIA - I, CIA - II, CIA - III and ESE

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ESE	From the date of joining	
	(1 st semester) / date of	
	commencement of class (2 nd to	75%
	8 th Semester) to the last day of	
	instruction	

Every course coordinator is required to maintain an ATTENDANCE AND ASSESSMENT RECORD' for every semester which consists of attendance marked in each Theory / practical/ EEC class etc, the assessment marks and the record of class work (topics covered), separately for each course handled by the course coordinator. This should be submitted to the HoD periodically (at least two times in a semester) for checking the syllabus coverage and the records of assessment marks and attendance. The HoD will affix his/her signature and date after due verification. At the end of the semester, the record should be verified by the HoD who shall keep this document after the approval from the Principal for five years. The records of attendance and assessment of both current and previous semesters should be available for inspection whenever required.

- **9.1.1** A student shall normally be permitted to appear for ESE of the course if he / she has satisfied the attendance requirements (vide Clause 8). He /she is eligible to register for ESE in that semester by paying the prescribed fee.
- **9.1.2** A Candidate who has fulfilled the following conditions shall be deemed to have satisfied the requirements for completion of a semester. Ideally every student is expected to attend all classes of all the courses and secure 100% attendance. However, in order to give provision for certain unavoidable reasons such as Medical / participation in sports, the student is expected to attend atleast 75% of the classes. Therefore, he/she shall secure not less than 75%.
- **9.1.3** However, a candidate who secures overall attendance between 65% and 75% in the current semester due to medical reasons (prolonged hospitalization / accident / specific illness)/Participation in Sports events may be permitted to appear for the current semester examinations subject to the condition that the candidate shall submit the medical certificate/ sports participation certificate attested by the Head of the Institution. The same shall be forwarded to the Controller of Examinations for record purposes.
- **9.1.4** Candidates who secure less than 65% overall attendance and candidates who do not satisfy the clause 8 shall not be permitted to write the ESE and not permitted to move to the next semester. They are required to repeat the incomplete semester in the next academic year, as per the norms prescribed.
- **9.1.5** The students who are consistently good in academics ONLY be considered for the grant of ODL under Co-curricular activities by the competent authorities. The following activities shall be considered for the sanction of ODL ;
 - Sports and Games : TIES, Inter Collegiate, Inter Zonal, Inter University, State Level, National Level and Open Tournaments.
 - () NCC : Camps and expeditions, NSS camps

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- O Cultural Programme at State, National and International Level
- Seminar / Symposia : Paper presentation/Quiz
- S Leadership courses organized by other organizations & Alumni Association activities, Association activities, Placement activities.

- O The ODL requisition letter shall be forwarded to the Principal through the HoD of the student by the staff-in-charge of the respective activities before completion of every activity.
- O The ODL sanctioned letters shall be submitted to the Department Office. The faculty-in-charge of the department office will check the eligibility for the award of attendance at the end of semester and the same may be submitted to DEC for approval.
- **9.1.6** The student should register all the courses of current semester and all the arrear courses in the previous semesters. If any student fails to register and pay the examination fees within the due date, he/she shall not be permitted to attend the ESE. However, he/she will be permitted to continue their studies in the next higher semester, provided that the student satisfies the requirements as stipulated in this clause of this regulation.
- **9.1.7** Those students who are not deemed to have completed the semester with references to the conditions specified above shall undergo the semester again in all the courses in the respective semester during next academic year. He/she shall seek re-admission as per the norms of the affiliating University/DOTE (Directorate of Technical Education).

The days of suspension for a student on disciplinary grounds will be considered as days of absence for calculating the percentage of attendance for each individual course.

10. TEMPORARY BREAK OF STUDY FROM A PROGRAMME

- **10.1** Break of study is normally not permitted. However, if a student intends to temporarily discontinue the programme in the middle of a semester / year for valid reasons (such as Internships, accident or hospitalization due to prolonged ill health) and wishes to re-join the programme in the next academic year, he / she shall apply in advance to the Principal through the HoD, stating the reasons. The application shall be submitted not later than the last date for registering for the ESE. Break of study is permitted only once during the entire period of the degree programme.
- **10.2** The student permitted to re-join the programme after the break shall be governed by the rules and regulations in force, at the time of re-joining.
- **10.3** The duration specified for passing all the courses for the purpose of classification of degree(vide clause 17) shall be increased by the period of such break of study permitted
- **10.4** If a student is detained for want of requisite attendance, academic progress and good conduct, the period spent in that semester shall not be considered as permitted Break of Study and Clause 10 is not applicable for such cases.

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11. ASSESSMENT PROCEDURES FOR AWARDING MARKS

All B.E. / B.Tech. Programmes consists of different categories of courses as mentioned in table 5. Appearance in ESE is mandatory for all courses excluding the courses for which only continuous assessment is recommended as mentioned in table 5.

Performance in each course of study shall be evaluated based on (i) Continuous assessments throughout the semester and (ii) ESE at the end of the semester. (i.e.) Each course shall be evaluated for a maximum of 100 marks as shown below :

S. No.	Category of course	CIA	ESE	
1.	Theory	40	60	
2.	Theory cum Practical	50	50	
3.	Practical	60	40	
4.	Project Work	40	60	
5.	Online SWAYAM/NPTEL Courses (Optional)	Marks offered by SWAYAM / NPTEL shall be directly considered		
6.	All CEC Courses (Except Practical Courses and Project Work)			
7.	Mandatory Courses (Except Induction Program [#])	100	_	
8.	Professional Certificate Courses * (Optional)			

Table 5 : Categories of Courses

Students can earn maximum of 6 credits in online mode (SWAYAM platform), out of these 18 credits as approved by Board of Studies.

B.E. / B. Tech. (Hons) Specialization in the same discipline, B.E. / B.Tech. Honors and B.E. / B.Tech. minor in other specialization degree will be optional for students.

For the categories 6.10.1 (i) to 6.10.1 (ii), the students will be permitted to register the courses from V Semester onwards provided the marks earned by the students until III semester should be of CGPA 7.50 and above and cleared all the courses in the first attempt.

For the category 6.10.1 (iii), the students will be permitted to register the courses from Semester V onwards provided the marks earned by the students until Semester III is CGPA 7.50 and above

If a student decides not to opt for Honours, after completing certain number of additional courses, the additional courses studied shall be considered instead of the Professional Elective courses which are part of the curriculum. If the student has studied more number of such courses than the number of Professional Elective courses required as per the curriculum, the courses with higher grades shall be considered for the calculation of CGPA. Remaining courses shall be printed in the grade sheet, however, they will not be considered for calculation of CGPA.

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If a student decides not to opt for Minor, after completing certain number of courses, the additional courses studied shall be considered instead of Open Elective courses which are part of the curriculum. If the student has studied more number of such courses than the number of open electives required as per the curriculum, the courses with higher grades shall be considered for calculation of CGPA. Remaining courses shall be printed in the grade sheet. However, they will not be considered for calculation of CGPA.

11.1 Assessment for Theory Courses Including Mandatory Courses

Theory Courses including mandatory courses are to be assessed out of 100 marks, the maximum marks for CIA is fixed as 40 and the ESE carries 60 marks.

The ESE for theory courses including mandatory courses will be of 3 hours duration and shall normally be conducted for a maximum of 100 marks during the Odd and Even Semesters. Every student should appear for the ESE for all the courses excluding the courses for which only continuous assessment is recommended.

A minimum of two tests would be conducted in a day (in the case of tests and they would be of two hours duration each) students will have two hours of coaching session followed by the CIA. In case a student misses the assessment due to medical reasons (hospitalization / accident / specific illness) or due to participation in the College / University / State / National / International level academic and sports events with prior permission from the HOD, a Reassessment may be given at the end of the semester after getting approval from the HOD through the Course Coordinator concerned.

To arrive the Continuous Assessment Marks, the following guidelines should be followed.

CIA I (100 Marks)		CIA II (100 Marks)		CIA III (100 Marks)		Total
Individual Assignment / Case Study / Seminar / Mini project	Written Test	Individual Assignment / Case Study / Seminar / Mini project	Written Test	Individual Assignment / Case Study / Seminar / Mini project	Written Test	Continuous Assessment Marks
40	60	40	60	40	60	300*

able 6 : Theor	y Courses	s : Continuous	Assessment Marks
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*The weighted average shall be converted into 40 marks for Internals

A minimum of three CIA will be conducted as a part of continuous assessment during the semester by the respective department. Each Continuous assessment is to be conducted for 100 marks and will have to be distributed in two parts viz., Individual Assignment/Case study/ Seminar/Mini project and Test with each having a weightage of 40% and 60% respectively. The tests shall be in written mode. The total Continuous assessment marks of 300 shall be converted into a maximum of 40 marks and rounded to the next integer.

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11.2 Assessment for Practical Courses

For practical including virtual practical Courses, out of 100 marks, the maximum marks for CIA is fixed as 60 and the ESE carries 40 marks.

Every practical exercise / experiment shall be evaluated (as per the rubrics approved by the class committee) based on conduct of experiment / exercise and records. There shall be at least one model test. The criteria for arriving at the CIA marks of 60 is as follows

Table 7 : Practical Courses : Continuous Internal Assessment Marks :

Continuous Assessment (100 Marks)*			
Evaluation of Laboratory experiment, results & Record	Test		
75	25		

*Continuous Assessment marks shall be converted into 60 marks

The ESE for practical courses shall be of 3 hours duration and normally be conducted for a maximum of 100 marks during the odd and Even Semesters.

11.3 Assessment for Theory with Practical Courses

Weightage of Continuous Assessment and end semester examination marks will be 50% each. The distribution of marks for the theory and laboratory components in the Continuous Assessment and end semester examination for different types of courses are provided in the table 8.

	т			D	C	Continue	ous Internal Ass	essment	ESE
L				I	II	III	ESE		
1	0	4	3	Laboratory (15%)	Laboratory (15%)	Theory (20%)	Laboratory only (50%)		
1	0	2	2	Laboratory (15%)	Laboratory (15%)	Theory (20%)	Laboratory only (50%)		
2	0	2	3	Theory (15%)	Theory (15%)	Laboratory (20%)	Theory (25%) Laboratory (25%)		
3	0	2	4	Theory (15%)	Theory (15%)	Laboratory (20%)	Theory (35%) Laboratory (15%)		
2	0	4	4	Theory (15%)	Theory (15%)	Laboratory (20%)	Theory (15%) Laboratory (35%)		

Table 8 : Theory Courses with Practical Component: Continuous Assessment Marks

The procedure for the conduct of Continuous Assessment for theory and laboratory components shall be as per the clause 10.1 and 10.2 respectively. The weighted average shall be converted into 50 marks for Continuous Internal Assessment.

11.4 Assessment for Project Work

The Project work such as mini project and final year project shall be carried out under the supervision of a faculty in the department concerned.

The students who completed their final semester courses (except project work) in advance, shall be permitted to carry out their final semester Project Work for six months in an industry/research organization on the recommendations of the HoD. In such cases the approval should be obtained from the industry concerned, the project work shall be jointly guided by a supervisor of the department and an expert as joint supervisor from the respective organization. The student shall be instructed to meet the supervisor periodically and to attend the review committee meetings and shall submit attendance particulars from the joint supervisor for evaluating the progress

For Project Work, out of 100 marks, the maximum marks for CIA is fixed as 40 and the ESE (Project Report evaluation and Viva-Voce examination) carries 6 0 marks. Project work may be carried out by a single student or a group of students (not exceeding 4).

There shall be three reviews during the semester. The student shall make presentation on the progress made by him / her before the "Project Review Committee". The total marks obtained in the three reviews shall be reduced for 40 marks and rounded to the next integer. The HoD shall constitute a "Project Review Committee" for each Programme. There shall be a minimum of three members in the Review Committee. The Project Guide will be one of the members of the Review Committee.

The student(s) is expected to submit the Project Report on or before the notified date. The ESE for Project Work shall consist of evaluation of the final Project Report submitted by the student(s) of the Project group and viva-voce examination by an external examiner and internal examiner.

The project report shall carry a maximum of 20 marks. The project report shall be submitted as per the approved guidelines as given by the CoE. Same marks shall be awarded to every student within the project group for the project report. The viva-voce examination shall carry 40 marks. Marks are awarded to each student of the project group is based on the individual performance in the viva- voce examination.

The CIA and ESE marks for Project Work and the Viva-Voce Examination will be distributed as indicated below.

Continuous Internal Assessment Marks (40)			End Se	mester Exan	ninations Ma	rks (60)
Review I	Review II	Review III	Project Report		Viva-Voce Examination	
10 15 15		15	Internal	External	Internal	External
10		15	10	10	20	20

Table 9 : Project Work : CIA and ESE

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The last date for submission of the project report is on the last working day of the semester. If a student fails to submit the project report on or before the specified deadline or the student has submitted the project report but did not appear for the viva-voce examination, it will be considered as fail in the Project Work and the student shall re-register for the same in the subsequent semester.

11.5 Interdisciplinary Project

For the final year Mini/ main project, students may be allowed to do interdisciplinary projects. The interdisciplinary project team consists of 4 members in a Team, consisting 3 students from 3 different branches or 4 students from same branch. First Project Guide shall be allotted from parent department and the second members shall be allotted from the respective domain (other department). The CIA of the project will be carried out by the Interdisciplinary Project Review committee by the respective departments. The Project Reviews, CIA Marks and ESE marks will be same as the Regular Project. Interdisciplinary Project Review Committee will be constituted by the CFRD Head and approved by the principal.

Table 10 : Interdisciplinary Project : Review Committee Constitution

Department X	Project Guide nominated by the HoD		
Department Y	One faculty nominated by the respective HoD		

The weightage for the project guides and project review committee members to award Continuous Assessment marks is indicated below.

Table 11: Interdisciplinary Project : CIA Marks

Project Guide	Member(s)
50%	50%

The ESE marks will be distributed as indicated below.

Table 12: Interdisciplinary Project : ESE Marks

Report Evaluation (20 Marks)	Viva - Voce	(40 Marks)
External Examiner : 1	External Examiner : 1	External Examiner : 1
20 Marks	20 Marks	10 Marks

Internal and External Examiners are from the two different departments (X & Y) of the students.

11.6 Assessment for Industrial Training / Practical Training / Internship

The Industrial training / Practical Training / Internship shall carry 100 marks and shall be evaluated through CIA only. At the end of Industrial training / Practical Training / Internship, the student shall submit a detailed report including attendance on the training undergone and a certificate from the organization concerned. The evaluation will be made based on this report and a Viva-Voce Examination, conducted internally by a three-member Departmental

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Evaluation Committee constituted by the HoD consisting of Programme Coordinator, Faculty Advisor concerned and Senior Faculty. The evaluation report duly signed by the departmental evaluation committee and HoD shall be submitted to the office of the CoE.

11.7 Assessment for Professional Certificate Courses

The Seminar / Case Study shall carry 100 marks and shall be evaluated through CIA only. Every student is expected to present a minimum of 2 seminars per semester before the evaluation committee and for each seminar, marks can be equally apportioned. A three member committee appointed by the Head of the Department, consisting of the course coordinator and two experts from the Department, will evaluate the seminar and at the end of the semester, the marks shall be consolidated and taken as the final mark. The evaluation shall be based on the seminar paper (40%), presentation (40%) and response to the questions asked during presentation (20%).

11.8 Assessment for Value Added Courses

The Value Added Courses shall carry 100 marks and shall be evaluated through Continuous Assessments only. Two assessments shall be conducted during the Semester by the department concerned. The total marks obtained in the tests shall be reduced to100 marks and rounded off to the nearest integer. The HOD may identify a faculty member as Coordinator for the Course. The Departmental Consultative committee consisting of the HOD, staff handling the course, Programme Coordinator and a Senior Faculty member nominated by the HOD shall monitor the evaluation process.

The Value Added Courses shall carry 100 marks and shall be evaluated through Continuous Assessments only. Two assessments shall be conducted during the Semester by the department concerned. The total marks obtained in the tests shall be reduced to100 marks and rounded off to the nearest integer. The HOD may identify a faculty member as Coordinator for the Course. The Departmental Consultative committee consisting of the HOD, staff handling the course, Programme Coordinator and a Senior Faculty member nominated by the HOD shall monitor the evaluation process. The B.E. /B.Tech. Candidates who enrolled for value added courses have to earn minimum of 75% attendance, failing which the registration for courses will be cancelled.

11.9 Assessment for SWAYAM/NPTEL Courses

The students may be permitted to credit online courses which are offered through SWAYAM/NPTEL platform with the approval of BoS concerned (vide Clause 5.9.4) The course shall carry 100 marks and the marks awarded by the SWAYAM/NPTEL shall be directly considered for grading of the course. No grades shall be awarded for the attendance in the grade sheet for the online course. The attendance requirement as mentioned in Clauses 8 of Regulations 2023 is not applicable for the SWAYAM/NPTEL courses.

11.10 Research Publication

The student can register for the Research Publication as a value added course of respective credits with the approval of BoS concerned. Maximum of two students can form a team under the guidance of a faculty member and complete the publication in SCI / SCI

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expanded / SCOPUS indexed / UGC Care list. Credits for the publication will be awarded as mentioned in Table 13. The students are not allowed for credit transfer for the research publication. The research publication completed in a semester during the course of study is eligible for including in the grade sheet in the immediate next EVEN / ODD by registering it.

Table 13 : Researc	h Publication :	: Award of Grade
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SI.No	Category of Journal	Credits
1.	One Research Publication in SCI/SCI-Expanded Journal	3
2.	One Research Publication in SCOPUS indexed Journal	2
3.	One Research Publication in UGC Care list Journal	1

12. MARKS DISTRIBUTION

12.1 Question paper pattern

1 Mark (Objective or any type)	2 Marks	13 Marks	Total Marks				
15	10	5 (Either or Type) 100					
For Engineering Graphics only							
7-	20 Marks Total Marks						
Π	100						

Table 14 : End Semester Examinations

13. PASSING REQUIREMENTS

- **13.1** A student who secures not less than 50% of total marks prescribed for the course [CIA + ESE] with a minimum of 45% of the marks prescribed for the ESE, shall be declared to have passed the course and acquired the relevant number of credits. This is applicable for theory, theory with practical component and practical courses (including project work).
- 13.2 If a student fails to secure a pass in a theory course / theory with practical component / practical course (except electives), the student shall register and appear only for the end semester examination in the subsequent semester. In such case, the CIA marks obtained by the student in the first appearance shall be retained and considered valid for all subsequent attempts till the student secures a pass. However, from the third attempt onwards if a student fails to obtain pass marks (CIA + ESE), then the student shall be declared to have passed the examination if he/she secures a minimum of 50% marks prescribed for the end semester examinations alone.
- **13.3** If the course, in which the student has failed, is a Professional Elective or Open Elective course, the student may be permitted to register for the same or any other elective course in the subsequent semesters.

If any other Professional Elective or Open Elective course is opted by the student, the previous registration is cancelled and henceforth it is to be considered as a new Professional Elective or

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Open Elective course. The student has to register and attend the classes, earn the continuous assessment marks, fulfill the attendance requirements as per clause 7 and appear for the ESE.

- **13.4** If a student fails to secure a pass in project work, the student shall register for the course in the subsequent semester/when offered next and repeat the course (vide clause 7.3.3).
- **13.5** The passing requirement for the courses which are assessed only through purely internal assessments (CEC courses except Project Work and practical), is 50% of the internal assessment (continuous assessment) marks only

13.6 Valued Answer Script review by the students

All the students are allowed to review their valued answer scripts with the faculty in-charge of the course on the specified date (usually the reopening day). Any discrepancies in the valuation can immediately be brought to the notice of the CoE through concerned HoD.

13.7 Revaluation

A student can apply for revaluation in a theory course within 2 working days from the date of review of valued answer scripts by the students on payment of a prescribed fee along with prescribed application to the CoE through the HoD. The CoE will arrange for the revaluation and the following procedure is followed in awarding Grade Points after revaluation:

- i. If there is a change from fail to pass for a Candidate in a Course, Grade Point is awarded as per the applicable (relative/absolute) grading.
- ii. If a passed candidate in a course obtains more marks after revaluation, Revised Grading is used only when the candidate gets Higher Grade, otherwise no change in the grade awarded before the revaluation.

The results will be intimated to the student concerned through the HoD within 5 working days from the last date of application of revaluation. Revaluation is not permitted for practical course, practical component of theory with practical component courses and project work.

13.8 Photocopy

Photo Copies of answer script for theory subjects can be obtained from the office of the Controller of Examinations on payment of a prescribed fee specified for this purpose through proper application.

13.9 Challenge revaluation

Challenging the revaluation is permitted for those students who have applied for photocopy of answer script. The copy of the answer script is to be valued by a competent authority and the valued script should be submitted to the office of the COE along with prescribed fee for challenging the revaluation within 2 working days after the declaration of the Re-valuation results.

14. AWARD OF LETTER GRADES

14.1 The award of grades will be decided based on relative grading principle. The relative grading is applicable to ONLY those students who have passed the examination as per the passing requirements enumerated above (vide clause 12). For those students who have not passed the examination, Reappearance (U) shall be awarded as shown in the below Table 15.

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For those students who have passed the course, the relative grading shall be done. The marks of those students who have passed only shall be considered for relative grading. The evolved relative grading method normalizes the results data using the BOX-COX transformation method and computes the grade range for each course separately and awards the grade to each student. For a given course, if the students' strength is greater than 30, the relative grading method shall be adopted. However, if the students' strength is less than 30 then the absolute grading shall be followed with the grade range as specified below.

0	A+	Α	B+	В	С	RA
91 - 100	81 - 90	71 - 80	61 - 70	56 - 60	50 - 55	< 50

Table 15 : Grades and Range of Marks

The performance of a student shall be reported using letter grades, each carrying certain points as detailed below.

LETTER GRADE	GRADE POINTS	RESULT		
O (Outstanding)	10			
A+ (Excellent)	9			
A (Very Good)	8	DASS		
B+ (Good)	7	FASS		
B (Average)	6			
C (Satisfactory)	COIMBATOR5			
U (Re-appearance)	0	RA (Re-appearance)		
SA (Shortage of Attendance)	0	RC (Repeat Course)		
WD (Withdrawal)	0	EA (Extended Appearance)		
AB (Absent)	0	RA (Re-appearance)		
WH (Withheld)	0	RA (Re-appearance)		

Table 16 : Grades and Grade Points

A student is deemed to have passed and acquired the corresponding credits in a particular course if he/she obtains any one of the following grades: "O", "A+", "A", "B+", "B", "C". 'SA' denotes shortage of attendance and hence prevented from writing the ESE. 'SA' will figure both in the Grade Sheet as well as in the Result Sheet.

"U" denotes that the student has failed to pass in that course. "WD" denotes withdrawal from the exam for the particular course. WH denotes the result withheld for the particular course. The grades U,WD and WH will figure both in the Grade Sheet as well as in the Result Sheet. In both cases, the student has to appear for the ESE.

If the grade U/AB is given to the courses which are evaluated through CIA and ESE, is not required to satisfy the attendance requirements, but has to appear for the end semester examination and fulfill the passing requirements to earn a pass in the respective courses.

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If the grade U/AB is given to the courses which are evaluated only through Continuous assessment, the student shall register for the course again in the subsequent semester, fulfill the passing requirements to earn pass in the course. However, attendance requirement need not be satisfied.

15. METHODS FOR REDRESSAL OF GRIEVANCES IN EVALUATION

Students who are not satisfied with the grades awarded in the ESE of Theory for regular and arrear exams can seek redressal as illustrated in Table 17

SI No	Podrossal Sought	Methodology						
31. NO.	Redressal Sought	Regular Exam	Arrear Exam					
1.	Revaluation	 Apply for viewing of answe revaluation after course ex 	er booklet and then apply for pert recommendation					
2.	Challenge of Evaluation	 Apply for viewing of answer after course expert recomr Next apply for challenge of 	r booklet and then apply for revaluation nendation. f evaluation					
Note : A	Note : All applications to be made to COE along with the payment of the prescribed fee.							

Table 17	:	Grievance	Redressal	Mechanism
		Oncrance	i tou coour	Meenanisin

Challenge of Evaluation – Flow Process

Table 18 : Challenge of Evaluation – Flow Process

Step 1	A student can make an appeal to the CoE for the review of answer scripts after paying the prescribed fee
Step 2	CoE will issue the viewing of answer scripts to the student
Step 3	The faculty who had handled the subject will evaluate the script and HoD will recommend.
Step 4	A committee consisting of 2 evaluators appointed by CoE will review and declare the result.
Step 5	If the result is in favour of the student, the fee collected will be refunded to the student.
Step 6	The final mark will be announced by CoE.

16. Grading System for Mandatory Courses

Mandatory Courses are courses that are required to be completed to fulfill the degree requirements (e.g. Life skills, Environmental science, etc.). They are normally non – credit based. These courses will not be taken in to consideration for the GPA / CGPA calculations. Each of these courses is assessed continuously and internally for a total mark of 100. The pass mark is 50%. Students, who fail to pass this course, are required to repeat the course, when offered next.

16.1 For mandatory non-credit courses the student must satisfy the minimum attendance requirement & passing criteria as specified for the course. These courses do not carry credits but needs to be completed to fulfill the degree requirements.

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16.2 For the mandatory non-credit courses student completing the course will be awarded Pass grade (P) grade and those who fail to satisfy the attendance requirement or fail to satisfy the minimum passing requirement of 50% marks, will be awarded Fail (F) grade and the student must re-register for the course when it is offered next.

16.3 Grade Sheet

After the results are declared, grade sheets will be issued to each student, which will contain the following details:

- () The College Name and Affiliating University.
- > The list of courses registered during the semester and the grades scored.
- () The Grade Point Average (GPA) for the semester.
- The Cumulative Grade Point Average (CGPA) of all courses registered from first semester onwards.
- On completion of a semester, each student is assigned a GPA which is computed as below for all courses registered for, by the student during that semester.

$$\bigcirc \quad \text{GPA} = \frac{\sum (C_i \times GP_i)}{\sum C_i}$$

where C_i is the credit for a course in that semester and GP_i is the Grade Point earned by the student for that course. The **SGPA** is rounded off to two decimals.

The overall performance of a student at any stage of the Degree programme is evaluated by the **CGPA** up to that point of time.

$$COIMBATOR = \frac{\sum (C_i \times GP_i)}{\sum C_i}$$

where C_i is the credit for each course in each of the completed semesters at that stage and GP_i is the grade point earned by the student for that course. The CGPA is rounded off to two decimals.

16.4 Formula for Calculating Percentage

CGPA x 9.5 = % of Marks

17. 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 particular programme within the stipulated time.
- ii. Successfully completed the course requirements, appeared for the ESE and passed all the subjects prescribed in all the 8 semesters within a maximum period of 7 years and 6 years in the case of Lateral Entry reckoned from the commencement of the first (third in the case of Lateral Entry) semester to which the candidate was admitted.
- iii. Successfully passed any additional courses prescribed by the Academic council

- iv. Successfully completed the NCC / NSS / NSO / YRC requirements if any.
- v. Successfully passed any additional courses prescribed by the Department & concerned whenever readmitted under regulations 2023 (R23) (vide Clause 3.3)
- vi. No disciplinary action pending against the student.
- vii. The award of Degree must have been approved by the Academic Council.

17.1 Classification of the Degree Awarded

17.1.1 First Class with Distinction

Degree (i)	Duration of programme (ii)	Duration permitted (iii)	Additional credits above the requirement of curriculum (iv)	CGPA (v)	Pass in (vi)	Break of study (vii)	Prevention due to lack of attendance	Withdrawal from writing ESE (viii)
B.E. / B.Tech. (Regular)	4 years	5 years	-	8.50	First attempt	One year authorized break of study included in the Duration permitted (iii)	Not permitted	Will not be considered as an attempt
B.E. / B.Tech. (Lateral Entry)	3 years	4 years	FBEY	8.50	First attempt	One year authorized break of study included in the Duration permitted (iii)	Not permitted	Will not be considered as an attempt
B.E. / B.Tech. (Honours) Specialisation in the same discipline	3 / 4 years (Lateral entry, Regular, respectively)	4 / 5 years (Lateral entry, Regular, respectively)	18 credits from any one vertical of the same programme	8.50	First attempt	One year authorized break of study included in the Duration permitted (iii)	Not permitted	Will not be considered as an attempt
B.E. / B.Tech. (Honours)	3/4 years (Lateral entry, Regular, respectively)	4/5 years (Lateral entry, Regular, respectively)	18 credits from more than one verticals of the same programme	IMBATC 8.50	RE First attempt	One year authorized break of study included in the Duration permitted (iii)	Not permitted	Will not be considered as an attempt
B.E. / B.Tech. minor in other specialisation	3/4 years (Lateral entry, Regular, respectively)	4/5 years (Lateral entry, Regular, respectively)	18 credits from any one vertical of the other programme	8.50	First attempt	One year authorized break of study included in the Duration permitted (iii)	Not permitted	Will not be considered as an attempt

17.1.2 First Class

Degree (i)	Duration (ii)	Duration permitted (iii)	Additional credits (iv)	CGPA (v)	Pass in (vi)	Break of study (vii)	Prevention due to lack of attendance	Withdrawa I from writing examination (viii)
B.E. / B.Tech. (Regular)	4 years	5 years	-	6.50	-	One year authorised break of study included in the Duration permitted (iii)	Included in the Duration permitted (iii)	_
B.E. / B.Tech. Lateral Entry	4 years	5 years	-	6.50	-	One year authorised break of study included in the Duration permitted (iii)	Included in the Duration permitted (iii)	_

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B.E. / B.Tech. (Honours) Specialisation in the same discipline	3 / 4 years (Lateral entry, Regular, respectively)	4 / 5 years (Lateral entry, Regular, respectively)	18 credits from any one vertical of the same programme	7.50	First attempt	One year authorised break of study included in the Duration permitted (iii)	Not permitted	Will not be considered as an attempt
B.E. / B.Tech. (Honours)	3/4 years (Lateral entry, Regular, respectively)	4/5 years (Lateral entry, Regular, respectively)	18 credits from more than one verticals of the same programme	7.50	First attempt	One year authorised break of study included in the Duration permitted (iii)	Not permitted	Will not be considered as an attempt
B.E. / B.Tech. minor in other specialisation	3/4 years (Lateral entry, Regular, respectively)	4/5 years (Lateral entry, Regular, respectively)	18 credits from more than one verticals of the other programme	6.50	-	One year authorised break of study Included in the Duration permitted (iii)	Included in the Duration permitted (iii)	-

18. PROVISION FOR WITHDRAWAL FROM EXAMINATION

- 18.1 A student may, for valid reasons, (medically unfit / unexpected family situations / sports approved by Head of the Institution) be granted permission to withdraw from appearing for the End Semester Examination in any course or courses in ANY ONE of the semester examinations during the entire duration of the degree programme. The application shall be sent to COE through the Head of the Institutions with required documents.
- **18.2** Withdrawal application is valid if the student is otherwise eligible to write the examination (Clause 10) and if it is made within TEN days after the date of the examination(s) in that course or courses and recommended by the Head of the Institution and approved by the Controller of Examinations. For a student to withdraw from a course / courses, he/she should have registered for the course, fulfilled the attendance requirements (vide clause 10) and earned continuous assessment marks.
- **18.3** 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.
- **18.4** If a student withdraws from writing end semester examinations for a course or courses, he/she shall register for the same in the subsequent semester and write the end semester examination(s).
- **18.5** If a student applies for withdrawal from Project Work, he/she will be permitted for the withdrawal only after the submission of project report before the deadline. However, the student may appear for the viva voce examination within 30/60 days after the declaration of results for Project Work and the same shall not be considered as reappearance.
- **18.6** Withdrawal shall not be considered as an appearance for deciding the eligibility of a student for First Class with Distinction.
- **18.7** Withdrawal is permitted for the ESE in the final semester as per Clause 7.1.

19. BREAK OF STUDY FROM A PROGRAMME

- **19.1** A student is permitted to go on break of study for a single break of one year only.
- **19.2** The student can apply for break of study in advance, in any case, not later than the last date of the first assessment period. The application duly filled by the student shall be submitted through the HoD with the approval of the Principal.

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- **19.3** The students permitted to rejoin the Programme after break of study / readmission 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 in the prescribed format through HoD 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.
- **19.4** The total period for completion of the programme reckoned from, the commencement of the first semester to which the student was admitted shall not exceed the maximum period specified in Clause 6 irrespective of the period of break of study in order that the student may be eligible for the award of the Degree (vide Clause 16).
- **19.5** In case there is any period of break of study more than the permitted duration of break of study, the student shall be permitted to continue the Programme only if the approval is obtained from the Director of Technical Education / University through the concerned HoD / Principal before the end of the Semester in which the student has taken break of study.
- **19.6** If a student has not reported to the department for a period of two consecutive Semesters without any intimation, the name of the student shall be deleted permanently from the college enrollment.
- **19.7** During the break of study period, the students shall pay the prescribed tuition fees failing which the name of the student shall be deleted permanently from the enrollment. Such students are not entitled to seek readmission under any circumstances.

20. RANKING OF A STUDENT

A candidate who qualifies for the degree by passing the examination in all courses of the entire Programme in first attempt within a period of Four or Five consecutive academic years applicable for the students joined after permitted Break of Study from the date of admission to the Programme can be given his/her position in the class as rank. The Rank is determined from IIIrd semester to VIIIth semester end semester examination CGPA. Students transferred from other institutions to KIT in IIIrd Semester and Lateral entry students are eligible for rank. Students transferred from other institutions beyond IIIrd Semester and students with history of arrears during the entire programme are not eligible for rank.

21. PROCEDURE FOR USING SCRIBE

If a candidate is physically handicapped (in case of accidents / ill health) at the time of examination, he/she may be permitted to use a scribe to write the examination. The compensatory (additional) time should be half hour for three hour duration of examination. The Scribe shall be a non-engineering student / graduate.

22. FACULTY MENTOR

To help the students in palnning their courses of study and for general advice on the academic matters, the HoD will attach a certain number of students (maximum 25) to a faculty member of the department. He / She shall function as Faculty Mentor for these students throughout their period of study. The faculty mentor shall,

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- O Advice the students in registering and reappearance registering of courses
- Monitor their attendance, academic progress and discipline of the students
- O Counsel periodically or during the faculty mentor meeting scheduled in the class time table.
- Inform the students about the various facilities and activities available to enhance the student's curricular and co-curricular activities
- If necessary, the faculty mentor may also discuss with or inform the parents about the progress of the students through HoD or in Parent-Teacher meeting.

23. CLASS COMMITTEE

The objective of the Class Committee is to improve the teaching-learning process.

The functions of the class committee include :

- ③ Resolving difficulties experienced by students in the classroom and in the laboratories.
- O Clarifying the regulations of the degree programme and the details of rules therein.
- Discussing the progress of academic schedule and deviations if any.
- Evaluating the performance of the students of the class after each test and finding the ways and means of improvement.
- Severy class in first year of study shall have a class committee consisting of faculty members who are teaching in that class, student representatives
- O Cross section of students from boys and girls and a chairperson who is a faculty not handling the course for the class.

From III semester onwards, Class committee comprises of all the faculty members who are handling courses in that particular semester and two student representatives from each course. A chairperson who is a faculty not handling course for that particular semester, nominated by the HoD shall coordinate the activities of this committee.

- The class committee shall be constituted by the HoD/Chief mentor on the first week of commencement of the semester.
- The class committee shall meet three times in a semester as specified in the academic calendar.
- The Principal may participate in any class committee meeting of the institution
- During these meetings, the representative of the class shall meaningfully interact and express the opinions and suggestions of the other students of the class to improve the effectiveness of the teaching-learning process.
- O The Chairperson is required to prepare the minutes of the meeting, signed by the members and submit the same to HoD within five working days of the meeting. HoD will in turn consolidate and forward the same to the Principal, within five working days of the meeting.
- In each meeting, the action taken report of the previous meeting is to be presented by the Chairperson of the class committee.

24. COMMON COURSE COMMITTEE

A theory course handled by more than one teacher shall have a "Common Course Committee" comprising of all teachers teaching that course and few students who have registered for that course. There shall be two student representatives from each batch of that course. One of the
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teachers shall be nominated as Course Coordinator by the HOD concerned and duly approved by the Principal

- The first meeting of the Common Course Committee shall be held within fifteen days from the date of commencement of the semester. The nature and weightage of the continuous assessments shall be decided in the first meeting, within the framework of the Regulations. Two or three 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 the whole batch.
- In addition, the "Common Course Committee" (without the student representatives) shall meet to ensure uniform evaluation of continuous assessments after arriving at a common scheme of evaluation for the assessments.

Wherever feasible, the common course committee (without the student representatives) shall also prepare a common question paper for the CIA tests. The question paper for the ESE is common and shall be set by the Course Coordinator in consultation with all the teachers or the external member as appointed by the CoE.

25. DETAILS OF FACULTY PEDAGOGICAL AND STUDENT ASSESSMENT RECORD

Every teacher is required to maintain a Faculty Record Book/ course file consisting of the following details as shown below ;

- Time-table, course syllabus, program outcomes, course outcomes.
- > Details of attendance of each student marked in each theory/practical/project work class.
- O CIA marks, Details of Assignment/ seminar given, course delivery details, corrective and preventive actions on test performance of students and any other additional details.

The record book should be submitted to the HoD periodically (at least three times in a semester) for checking the syllabus covered, the test marks and attendance. The HoD shall put his/her signature and date in the record book after due verification. At the end of the semester, the record book shall be verified by the Principal who will also ensure safe custody of the document for at least four years. The university or any inspection team appointed by the University/UGC/AICTE may verify the records of attendance.

26. DISCIPLINE

Every student is required to maintain discipline and decorum both inside and outside the institution campus. They shall follow all the rules and regulations and should not indulge in any activity which can tarnish the reputation of the Institution. The Principal shall refer any act of indiscipline by students to the Discipline and Welfare Committee and other appropriate committees for action.

27. SPECIAL CASES

In the event of any clarification in the interpretation of the above rules and relations, they shall be referred to the Standing Committee. The standing committee will offer suitable interpretations/ clarifications/amendments required for special case on such references and get them ratified in the next meeting of the Academic Council. The decision of the Academic Council is final.

ANNEXURE - I

COURSE NUMBERING SCHEME

В	2	3	М	E	Т	7	0	9					
Programme	Regu	lation	Departm	ent Code	Course Type	Semester	Sequence	e Number					
Programme	:				Course Type	Course Type							
Bachelor Deg	ree (B.E	E. / B.Te	ch) - B		T - Theory								
Masters Degr	ee (M.E	. / M.Te	ch) - M		P - Practical /	Project / Inte	ernship						
Regulation :					E - Elective								
R – 23					O - Open Ele	ctive							
Department	Code				C - Credit								
AE - Aeronau	tical Eng	gineerin	g		N - Online co	urses							
AG - Agricultu	iral Eng	ineering			S - Special El	ectives							
BT - Bio Tech	nnology			SEY(DND .								
BM - Bio Med	ical Eng	gineering		6-	Semester	Semester							
CS - Compute	er Scien	ce and	Engineerir	ng	1 - First Seme	1 - First Semester							
EC - Electron	ics and	Commu	nication E	ngineering	2 - Second Se	2 - Second Semester							
EE - Electrica	l and El	ectronic	s Enginee	ring	3 - Third Sem	3 - Third Semester							
ME - Mechan	ical Eng	lineering		S K	4 - Fourth Se	4 - Fourth Semester							
AD - Artificial	Enginee	ering & [Data Scien		B 5- Fifth Seme	5 - Fifth Semester							
CB - Compute	er Scien	ce & Bu	siness Sy	stem	6 - Sixth Sem	6 - Sixth Semester							
AM - Comput	er Scien	nce & Er	ngineering	(AIML)	7 - Seventh S	emester							
CA - Masters	in Com	outer Ap	plication		8 - Eighth Sei	mester							
MB - Masters	in Busir	ness Ad	ministratio	n									
CH - Chemist	ry				Sequence N	umber							
EN - English					00-99								
PH - Physics													
MA - Mathem	atics												
MC - Mandato	ory Cou	rse											
CE - Career E	Enhance	ement co	ourse										

ANNEXURE - II

POLICY ON MALPRACTICES

GENERAL

It shall be the endeavour of all concerned to prevent, control and take remedial action to bring about the occurrences of malpractices to "Zero" in Examinations (both Internal and External), Assignments and in all Academic class works.

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- O Therefore, a comprehensive approach to the malady of malpractices has to be adopted to create a mindset of integrity and honesty, and at the same time take sufficiently stern action to make it clear that such attempts are fraught with comparably very high risk.
- In keeping with this stance, the following measures are to be taken by all concerned from class room level to the Examination Halls :

A. PREVENTION

a. Class room level :

All faculty members are to involve themselves in a psychological growth of students by personal example and self-respect and strive towards.t

- () Developing a sense of honour in the minds of students so that they look down upon earning undeserved marks.
- () Imbibing a sense of self-respect and internal dignity that prevents him/her from succumbing to the temptation of easy marks by cheating.
- Generating an awareness of the risks to their character and career if convicted, while also explaining the process and strict rules and regulations adopted by the educational system to prevent malpractices.
- > Taking stern view of copied assignments and attempts at malpractices in internal examinations also merits equal seriousness as semester examinations.
- Setting sufficiently strong deterrent rules in place and regulations like intimation to parents and warning to students in the presence of parents etc. even in case of efforts at malpractices in internal tests and/or repeated acts despite warnings in case of assignments also.

Examination Halls

Detailed instructions on Invigilation, question paper setting and evaluation and such other instructions will be issued for Invigilation, vigilance, which are to be brought to the notice of all students prior to the examinations.

B. PENAL ACTION FOR MALPRACTICES

All instances of malpractices will be forwarded to the Principal / Chief Superintendents. The offences will be investigated by a Standing Enquiry Committee constituted by Principal, The committee is to summon and give the student an opportunity to present / plead his/her case. The Committee may also summon anybody else, if it so deems necessary for the conduct of enquiry, in the interest of proper investigation and dispensation of the case. The tenure of the committee would be a complete Academic year.

The Committee is to be guided by the following :

- S The seriousness of the malpractice, in terms of deviousness, and culpability / criminality of motive.
- S The seriousness in terms of effort and degree of deviousness and culpability / criminality of effort.
- O Any FIR / Police case that has been registered in the first instance by the Principal/ Chief Superintendent.
- O Any other special consideration either mitigating or to the contrary.

C. PENALTY FOR OFFENSES

The penalties awarded will depend on the seriousness of the offence. A list of offences and penalties are placed at **Annexure III**.

The enquiry report with findings and recommendations of the committee are to be forwarded to the Controller who will undertake necessary follow up action. Based on the recommendations of the CoE, the Principal is empowered to award penalties for offences classified as belonging to categories 1 to 7 of the offence table. The cases falling in categories from S.No. 8 onwards are to be put up to the Principal for consideration and award of suitable penalty.

ANNEXURE - III

SI.No.	Nature of Malpractice	Maximum Punishment
1.	Appeal by the candidate in the answer script to show mercy by way of awarding more than deserving marks.	
2.	The candidate writing his/her name in the answer script.	2ET
3.	The candidate writing his / her registration number / college name in places other than specified in the answer script	
4.	Any special marking in the answer script by the candidate.	Fine of Rs. 1000/- per subject.
5.	The candidate communicating with neighbouring candidate orally or non-verbally; the candidate causing suspicious movement of his/her body.	
6.	Irrelevant writing by the candidate in the answer script.	
7.	The candidate writing answer on his/her question paper or making use of his/her question paper for rough work.	
8.	The candidate possessing cell phones / programmable calculator(s)/any other electronic storage device(s) gadgets	Invalidating the examination of the particular subject written by the candidate
9.	The candidate possessing any incriminating material(s) (whether used or not). For example : Written or printed materials, bits of papers containing written information, writings on scale, calculator, handkerchief, dress, part of the body, Hall Ticket, etc.	Invalidating the examination of the particular subject written by the candidate.

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10.	The candidate possessing cell phone(s)/ programmable calculator(s)/any other electronic storage device(s) gadgets and containing incriminating materials (whether used or not).
11.	The Candidate possessing the question paper of another candidate with additional writing on it.
12.	The candidate passing his/her question paper to another candidate with additional writing on it.
13.	The candidate passing incriminating materials brought into the examination hall in any medium (hard/soft) to other candidate(s).
14.	The candidate copying from neighbouring candidate.
15.	The candidate taking out of the examination hall answer booklet(s), used or unused.
16.	Appeal by the candidate in the answer script coupled with a promise of any form of consideration.
17.	Candidate destroying evidence relating to an alleged irregularity.

Invalidating the examination of the subject concerned and all the theory and the practical subjects of the current semester registered by the candidate.

Further the candidate is not considered for revaluation of answer scripts of the arrears-subjects.

If the candidate has registered for arrears – subjects only, invalidating the examinations of all the arrears – subjects registered by the candidate.

Invalidating the examinations of the subject concerned and all the theory and the practical subjects of the current semester registered by the candidate.

Further the candidate is not considered for revaluation of answer scripts of the arrears-subjects.

If the candidate has registered for arrears – subjects only, invalidating the examinations of all the arrears – subjects registered by the candidate.

Additional Punishment :

- If the candidate has not completed the programme, he/she is debarred from continuing his/her studies for one year i.e., for two subsequent semesters. However the student is permitted to appear for the examination in all the arrears-subjects during the debarred period.
- ii. If the candidate has completed the programme, he/she is prevented from writing the examinations of the arrears subjects for two subsequent semesters.

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18.	Vulgar / offensive writings by the candidate in the answer script.	Invalidating the examinations of all the theory and practical subjects of the current
19.	The candidate possessing the answer script of another candidate.	semester and all the arrears – subjects registered by the candidate.
20.	The candidate passing his /her answer script to another candidate.	
21.	Involved in any one or more of the malpractices of serial no. 8 to 21 for the second or subsequent times.	Invalidating the examinations of all the theory and practical courses of the current semester and all the arrears- courses
22.	The candidate substituting an answer sheets prepared outside the examination hall for the one already distributed to the candidate.	 registered by the candidate. Additional Punishment : If the candidate has not completed the programme, he/she is debarred from continuing his/her studies for one year i.e., for two subsequent semesters. However the student is permitted to appear for the examination in all the arrears-subjects during the debarred period. If the candidate has completed the programme, he/she is prevented from writing the examinations of the arrears - subjects for two subsequent semesters.
23.	The candidate indulge in any disruptive conduct including, but not limited to, shouting, assault of invigilator, officials or students using abusive and / or threatening language, destruction of property.	Invalidating the examinations of all the theory and practical courses of the current semester and all the arrears- courses registered by the candidate. Additional Punishment :
24.	The candidate harass or engage others to harass on his/her behalf an invigilator, official, witnesses or any other person in relation to an irregularity by making telephone calls, visits, mails or by any other means.	 i. If the candidate has not completed the programme, he/she is debarred from continuing his/her studies for two years i.e., for four subsequent semesters. However the student is permitted to appear for the examination in all the
25.	Candidate possessing any firearm/weapon inside the examination hall.	arrears-subjects during the debarred period.ii. If the candidate has completed the programme, he/she is prevented from writing the examinations of the arrears - courses for four subsequent semesters.

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26.	Cases of Impersonation	i. Handing over the impersonator to the
		police with a complaint to take appropriate
		action against the person involved in the
		impersonation by the Chief Supt.
		If a student is found to impersonate
		a 'bonafide student', the impersonating
		student is debarred from continuing his /
		her studies and writing the examinations
		permanently. He/she is not eligible for any
		further admission to any programme.
		Debarring the 'bonafide student' for
		whom the impersonation was done from
		continuing his / her studies and writing the
		examinations permanently. He/she is not
	CYON/	eligible for any further admission to any
	BE	programme.

APPENDIX - IV

Process to Consider the Application for Revocation of Detainment

The process to consider the application for revocation of detainment on account of lack of attendance in 3 or more courses, due to genuine reasons (viz. sports participation, NCC, Medical Grounds etc.) is as follows :

The student submits an application for consideration via a request letter to the CoE,not later than 3 days from the last working day, along with the HoD's recommendation, Class Advisor's report and Mentor's recommendation. A committee consisting of the Principal, CoE, HoD (Respective Department) and HoD's-2 from departments other than the student's own. The committee shall meet within 4 working days,to consider the case. Stakeholders may be called to be present in the meeting as may be required, and Decision arrived at.The decision approved by Principal shall be final.

APPENDIX - V

Academic Evaluation Committee (AEC)

The committee includes the Principal, CoE, HoD concerned. The committee meets to carry out business related to academic matters which require central decision making and approval viz. retest approval of missed CIA, addressing the feedback collected from the various departments' class committee meetings

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Department Evaluation Committee (DEC)

The committee includes HoD (need basis), and a few faculty members of the department from various levels. The committee meets to carry out business related to academic matters that can be addressed within the department viz. course equivalence of common courses for readmitted students; approval of new courses to be offered by the department; consider and approve the credit equivalence of courses offered by industry, review the course offerings; consider the merit of applications involving lack of attendance in PE/OE courses to take up another PE or OE; approve CIAM only courses every semester; approve scheme of assessment for each course; Approval for and Mapping credits of certification courses; approval of list of nationally or internationally recognized professional certification courses with prometric testing.



Curriculum

R2023 -

Conceptual Frame work (For Students admitted from the Academic Year 2023-24 and onwards)									
Semester	Level of Course	Hours / Week	No of Courses	Range of Credits / Courses	Total Credits				
PART – I									
A - Foundatio	n Courses								
I to VII	Humanities and Social Sciences (HS)	1- 4	6	1 - 4	10				
I to IV	Basic Sciences (BS)	3 - 4	6	2 - 4	24				
I to II	Engineering Sciences (ES)	4 - 5	5	2 - 4	18				
B - Profession	nal Core Courses								
III to VII	Professional Core (PC)	3 - 5	26	2 - 4	73				
C - Elective C	ourses								
V to VIII	Professional Elective (PE)	3 - 5	6	3	18				
V to VIII	Open Elective (OE)	3 - 5	4	3	12				
D - Project W	ork								
VI, VII & VIII	Project Work (PW)	4 -16	3	2 - 8	12				
E - Mandatory	Courses Prescribed by AICTE/UGC (N	lot to be Inc	luded for C	GPA)					
V & VI	Mandatory Course (MC)	3	2	NC	NC				
	Total Credit				167				
	PART – II								
F- Career Enh	ancement Courses (CEC)								
II	Soft Skills	2	1	-	NC				
IV	Professional Certificate course	-	1	1	1				
V	Summer Internship	-	1	1	1				
	Total Credit				02				
	Total Credit to be Earr	ed			169				

Hedrew Programme Coordinator



Curriculum and Scheme of Assessment

(For Students admitted from the Academic Year 2023-24 and onwards)

Semester – I										
Course	Course Name	ст	Instructional Hours				5	Assessment		ent
Code	Course Name	CI	СР	L	т	Р	С	CIA	ESE	Total
B23IPT101	Induction Programme	HS	-	-	-	-	0	-	-	-
Theory / Theory with Practical										
B23MAT101	Matrices and Differential Calculus	BS	4	3	1	0	4	40	60	100
B23MET101	Engineering Graphics	ES	4	2	2	0	4	40	60	100
B23HST101	தமிழர் மரபு / Heritage of Tamils	HS	1	1	0	0	1	40	60	100
B23ENI101	Professional Communication	HS	5	3	0	2	4	50	50	100
B23CHI101	Engineering Chemistry	BS	5	3	0	2	4	50	50	100
B23CSI102	Problem Solving and Python Programming	ES	5	3	0	2	4	50	50	100
Practical	BET		D	~						
B23MEP101	Engineering Practices Laboratory	ES	4	0	0	4	2	60	40	100
	Total credits to be earn	ed					23			

Semester – II

Jeinealei – II										
Course	Course Name	СТ	Instructional Hours				5	Assessment		
Code			СР	L	Т	Р	С	CIA	ESE	Total
Theory / Theo	Theory / Theory with Practical									
B23ENT101	Professional English	HS	2	2	0	0	2	40	60	100
B23MAT201	Integral Calculus and Complex Analysis	BS	4	3	\sum	0	4	40	60	100
B23MET201	Engineering Mechanics	ES	4	3	1	0	4	40	60	100
B23HST201	தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	HS	1	1	0	0	1	40	60	100
B23PHI101	Engineering Physics	BS	5	3	0	2	4	50	50	100
B23EEI202	Basics Electrical and Electronics Engineering	ES	5	3	0	2	4	50	50	100
B23CEP201	Soft Skills	CEC	2	2	0	0	NC	100	-	100
	Total credits to be earn	ed					19			

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Semester – III											
Course	Course Name	СТ	Instructional Hours				5	Assessment			
Code	Course Name		СР	L	Т	Ρ	С	CIA	ESE	Total	
Theory / Theory with Practical											
B23MAT301	Transforms and Partial Differential Equations	BS	4	3	1	0	4	40	60	100	
B23AET301	Fundamentals of Aerospace Engineering	PC	3	3	0	0	3	40	60	100	
B23AET302	Solid Mechanics	PC	3	3	0	0	3	40	60	100	
B23AET303	Engineering Fluid Mechanics	РС	3	3	0	0	3	40	60	100	
B23AEI301	Aero Engineering Thermodynamics	PC	5	3	0	2	4	50	50	100	
Practical											
B23AEP301	Solid Mechanics Laboratory	PC	4	0	0	4	2	60	40	100	
B23AEP302	Engineering Fluid Mechanics Laboratory	PC	4	0	0	4	2	60	40	100	
	Total credits to be earn	ed					21				

Semester – IV										
Course		OT	Instructional Hours					Assessment		
Code	Course Name		СР	L	т	Р	С	CIA	ESE	Total
Theory / Theo	Theory / Theory with Practical									
B23MAT403	Numerical Methods	BS	4	3	1	0	4	40	60	100
B23AET401	Advanced Solid Mechanics	PC	4	3	1	0	4	40	60	100
B23AET402	Air Breathing Propulsion	PC	3	3	0	0	3	40	60	100
B23AET403	Aircraft Systems and Instruments	PC	3	3	0	0	3	40	60	100
B23AEI401	Low Speed Aerodynamics	PC	5	3	0	2	4	50	50	100
Practical								•		
B23AEP401	Aircraft Component Drawing Laboratory	PC	4	0	0	4	2	60	40	100
B23CEP301	Professional Certificate Course	CEC	2	0	0	2	1	100	-	100
	Total credits to be earned						21			
Summer Inter included in Set	rnship – Three Weeks (Review will be mester V) / NPTEL / Product Developme	conduc ent / Min	ted in t i Proje	first we ect / Mo	eek of odel De	Semes evelop	ster V ment	and its	credit	will be

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	Semester – V									
Course		СТ	Instructional Hours				S	As	Assessment	
Code	de Course Name		СР	L	т	Р	С	CIA	ESE	Total
Theory / Theo	ory with Practical									
B23AET501	Aircraft Performance	PC	3	3	0	0	3	40	60	100
B23AET502	High Speed Aerodynamics	PC	4	3	1	0	4	40	60	100
B23AET503	Rocket and Spacecraft Propulsion	PC	3	3	0	0	3	40	60	100
B23AEI501	Aircraft Structures	PC	5	3	0	2	4	50	50	100
	Professional Elective - I	PE	3	3	0	0	3	40	60	100
	Open Elective - I	OE	3	3	0	0	3	40	60	100
	Environmental Sciences	MC	3	3	0	0	NC	100	-	100
	Pi	ractica	I							
B23AEP501	Propulsion Laboratory	PC	4	0	0	4	2	60	40	100
B23AEP502	Aircraft Design Laboratory	PC	4	0	0	4	2	60	40	100
B23CEP501	Summer Internship	CEC	D	2	-	-	1	100	-	100
	Total credits to be earn	ed					25			

Semester – VI										
Course	Course Norma	CT	I	nstruc	ctional	Hour	S	As	sessm	ent
Code	Course Name		СР	L	т	Р	С	CIA	ESE	Total
Theory / Theo	ory with Practical				<u> </u>			•		
B23AET601	Finite Element Methods	PC	3	3	0	0	3	40	60	100
B23AET602	Composites Materials and Structures	PC	3	3	0	0	3	40	60	100
B23AET603	Aircraft Stability and Control	PC	3	3	0	0	3	40	60	100
	Professional Elective - II	PE	3	3	0	0	3	40	60	100
	Professional Elective - III	PE	3	3	0	0	3	40	60	100
	Open Elective - II	OE	3	3	0	0	3	40	60	100
	Indian Constitution	MC	3	3	0	0	NC	100	-	100
Practical										
B23AEP601	Aero Engine and Airframe Laboratory	PC	4	0	0	4	2	60	40	100
B23AEP602	Aircraft Systems Laboratory	PC	4	0	0	4	2	60	40	100
B23AEP603	Design Thinking and Innovation Project	PW	4	0	0	4	2	40	60	100
	Total credits to be earned 24									

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	Semester – VII										
Course	Course Name	ст	I	nstruc	tional	Hours	5	As	sessm	ent	
Code	Course Name	U	СР	L	т	Ρ	С	CIA	ESE	Total	
Theory / Theo	ory with Practical										
B23MGT701	Universal Human Values	HS	3	3	0	0	2	40	60	100	
B23AET701	Computational Fluid Dynamics	РС	3	3	0	0	3	40	60	100	
B23AEI701	Avionics	РС	5	3	0	2	4	50	50	100	
	Professional Elective – IV	PE	3	3	0	0	3	40	60	100	
	Professional Elective – V	PE	3	3	0	0	3	40	60	100	
	Open Elective - III	OE	3	3	0	0	3	40	60	100	
Practical	DEYC	AC	D	~							
B23AEP701	Computer Aided Simulation Laboratory	PC	4	0	0	4	2	60	40	100	
B23AEP702	Project work Phase – I	PW	6	0	0	6	2	40	60	100	
	Total credits to be earned 22										

Semester – VIII										
Course	Course Name	СТ	I	nstruc	tional	Hours	S	As	sessm	ent
Code	Course Name	CI	СР	L	т	Ρ	С	CIA	ESE	Total
Theory / Theo	Theory / Theory with Practical									
	Professional Elective - VI	PE	3	3	0	0	3	40	60	100
	Open Elective - IV	OE	3	3	0	0	3	40	60	100
Practical			-				-			
B23AEP801	B23AEP801 Project Work Phase - II PW 16 0 0 16 8 40 60 100									
	Total credits to be earned 14									

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HUMANITIES AND SOCIAL SCIENCES (HS)

Course	Course Course Name		I	nstruc	tional	S	Assessment			
Code	Course Name	U	СР	L	т	Р	С	CIA	ESE	Total
B23IPT101	Induction Programme	HS	-	-	-	-	0	-	-	-
B23ENT101	Professional English	HS	2	2	0	0	2	40	60	100
B23HST101	தமிழர் மரபு / Heritage of Tamils	HS	1	1	0	0	1	40	60	100
B23ENI101	Professional Communication	HS	5	3	0	2	4	50	50	100
B23HST201	தமிழரும் தொழில் நட்பமும் /Tamils and Technology	HS	1	1	0	0	1	40	60	100
B23MGT701	Universal Human Values	HS	3	3	0	0	2	40	60	100

	BASIC SC	CIENCI	ES (BS	5)						
Course	Course Name	ст	I	nstruc	ctional	s	Assessment			
Code	Course Name		СР	L	Т	Р	С	CIA	ESE	Total
B23MAT101	Matrices and Differential Calculus	BS	4	3	1	0	4	40	60	100
B23CHI101	Engineering Chemistry	BS	5	3	0	2	4	50	50	100
B23PHI101	Engineering Physics	BS	5	3	0	2	4	50	50	100
B23MAT201	Integral Calculus and Complex Analysis	BS	4	3	1	0	4	40	60	100
B23MAT301	Transforms and Partial Differential Equations	BS	4	3	1	0	4	40	60	100
B23MAT403	Numerical Methods	BS	4	3	1	0	4	40	60	100

ENGINEERING SCIENCES (ES)											
Course	Course Nome	СТ	I	nstruc	ctional	Hour	S	Assessment			
Code	Course Name		СР	L	т	Р	С	CIA	ESE	Total	
B23MET101	Engineering Graphics	ES	4	2	2	0	4	40	60	100	
B23CSI102	Problem Solving and Python Programming	ES	5	3	0	2	4	50	50	100	
B23MEP101	Engineering Practices Laboratory	ES	4	0	0	4	2	60	40	100	
B23MET201	Engineering Mechanics	ES	4	3	1	0	4	40	60	100	
B23EEI202	Basics Electrical and Electronics Engineering	ES	5	3	0	2	4	50	50	100	

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Course	Course Name	СТ	Ins	tructio	nal Ho	urs		Asses	sment	
Code	Course Name		СР	L	Т	Р	С	CIA	ESE	Total
B23AET301	Fundamentals of Aerospace Engineering	PC	3	3	0	0	3	40	60	100
B23AET302	Solid Mechanics	PC	3	3	0	0	3	40	60	100
B23AET303	Engineering Fluid Mechanics	PC	3	3	0	0	3	40	60	100
B23AEI301	Aero Engineering Thermodynamics	PC	5	3	0	2	4	50	50	100
B23AEP301	Solid Mechanics Laboratory	PC	4	0	0	4	2	60	40	100
B23AEP302	Engineering Fluid Mechanics Laboratory	PC	4	0	0	4	2	60	40	100
B23AET401	Advanced Solid Mechanics	PC	4	3	1	0	4	40	60	100
B23AET402	Air Breathing Propulsion	PC	3	3	0	0	3	40	60	100
B23AET403	Aircraft Systems and Instruments	PC	3	3	0	0	3	40	60	100
B23AEI401	Low Speed Aerodynamics	PC	5	3	0	2	4	50	50	100
B23AEP401	Aircraft Component Drawing Laboratory	PC	4	0	0	4	2	60	40	100
B23AET501	Aircraft Performance	PC	3	3	0	0	3	40	60	100
B23AET502	High Speed Aerodynamics	PC	4	3	1	0	4	40	60	100
B23AET503	Rocket and Spacecraft Propulsion	PC	3	3	0	0	3	40	60	100
B23AE1501	Aircraft Structures	PC	ORE I	3	0	2	5	50	50	100
B23AEP501	Propulsion Laboratory	PC	4	0	0	4	2	60	40	100
B23AEP502	Aircraft Design Laboratory	PC	4	0	0	4	2	60	40	100
B23AET601	Finite Element Methods	PC	3	3	0	0	3	40	60	100
B23AET602	Composites Materials and Structure	S PC	3	3	0	0	3	40	60	100
B23AET603	Aircraft Stability and Control	PC	3	3	0	0	3	40	60	100
B23AEP601	Aero Engine and Airframe Laborator	y PC	4	0	0	4	2	60	40	100
B23AEP602	Aircraft Systems Laboratory	PC	4	0	0	4	2	60	40	100
B23AET701	Computational Fluid Dynamics	PC	3	3	0	0	3	40	60	100
B23AEI701	Avionics	PC	5	3	0	2	4	50	50	100
B23AEP701	Computer Aided Simulation Laboratory	PC	4	0	0	4	2	60	40	100

PROFESSIONAL CORE (PC)

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PROJECT WORK (PW)												
Course	Course Name	ст	Instructional Hours Assessment									
Code	Course Name	CT CP L T P C CIA ESE TO							Total			
B23AEP603	Design Thinking and Innovation Project	PW	4	0	0	4	2	40	60	100		
B23AEP702	Project work Phase – I	PW	6	0	0	6	2	40	60	100		
B23AEP801	Project Work Phase - II	PW	16	0	0	16	8	40	60	100		

	MAND	ATOR	(COUF	RSE (MO	C)					
Course	Course Name	e CT Instructional Hours Assessmen								
Code	Course Name		СР	L	т	Р	С	CIA	ESE	Total
	Indian Constitution	МС	3	3	0	0	NC	100	-	100
	Environmental Sciences	МС	3	3	0	0	NC	100	-	100
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CAREER ENHANCEMENT COURSE (CEC)											
Course	Course Name	ст		Instru	ctional	Hours		As	ssessment		
Code	Course Name	CT CP L T P C CIA ESE TO								Total	
B23CEP201	Soft Skills	CEC	bat 2)re	2	0	0	NC	100	-	100	
B23CEP301	Professional Certificate Course	CEC	2	0	0	52	1	100	-	100	
B23CEP501	Summer Internship	CEC	-	-		-	1	100	-	100	

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Syllabus

Semester – I

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B.E. / B.Tech.	P22ENT404 DDOEESSIONAL ENGLISH	L	т	Р	С
(Except CSBS)	BZJENTIUT - PROFESSIONAL ENGLISH	2	0	0	2

Course Objectives		
1.	To develop the listening and reading skills of first year engineering and technology students.	
2.	To help learners' develop vocabulary through reading skills.	
3.	To enhance learners' grammatical knowledge.	
4.	To enhance the learners' ability of writing different complex texts.	
5.	To develop the competency of learners through LSRW skills.	

	UNIT – I	6
Listening	Listening to voicemail & messages; Listening and contextualizing.	
Speaking	Replying to polite requests and offers, understanding basic instruction	ons.
Reading	Short comprehension passages, practice in skimming & scanning.	
Writing	Writing Instructions.	
Language development	Parts of Speech, Wh - Questions, yes or no questions, Question tag	gs.
Vocabulary development	Prefixes - suffixes.	

	UNIT – II	6
Listening	Listening commentaries and announcements.	
Speaking	Role Play exercises based on workplace contexts.	
Reading	Comprehension questions including dialogues and conversations.	
Writing	Writing different types of Paragraph.	
Language development	Regular & Irregular Verbs, Tenses.	
Vocabulary development	Understanding contextual meaning, Synonyms.	

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	UNIT – III	6
Listening	Listening to a product launch-sensitizing leaners to the nuand persuasive communication.	es of
Speaking	Debate - discussion on current issues.	
Reading	Short texts and longer passages - note making.	
Writing	Understanding text structure, use of reference words and disc markers, jumbled sentences.	ourse
Language development	Idioms and Phrases, Degrees of comparison.	
Vocabulary development	One word substitutes.	

	UNIT – IV	6
Listening	Listening to short academic videos.	
Speaking	Making short presentation through short films.	
Reading	Intensive and Extensive reading-reading different types of magazin	es.
Writing	Letter writing- formal and informal.	
Language development	Direct / indirect questions.	
Vocabulary development	Phrasal verbs	

	UNIT – V	6
Listening	Listening to talks/lectures by specialists on specific topics.	
Speaking	Discussion on general and current topics.	
Reading	Longer texts - cloze reading.	
Writing	iting Writing short essays, developing outline, identifying main and subordinat ideas, Dialogue writing.	
Language development	Spelling and Punctuations, Modal verbs.	
Vocabulary development	Collocations	
	Total Instructional hour	s : 30

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	Course Outcomes : Students will be able to		
CO1	Develop listening and reading skills for effective communication		
CO2	Develop vocabulary skills		
CO3	Build grammatical understanding		
CO4	Explain opinions efficiently in writing formal and informal contexts		
CO5	Develop knowledge through LSRW skills		

	Text Books			
1.	Board of Editors Using English, "A Course book for Undergraduate Engineers and Technologists", Orient Black Swan Limited, Hyderabad : 2015.			
2.	Richards, C. Jack," Interchange Students Book - 2", New Delhi, CUP, 2015.			

	Reference Books		
1.	Bailey, Stephen, "A practical guide for students", New York Rutledge, 2011.		
2.	Raman, Meenakshi and Sharma, Sangeetha "Technical Communication Principles and Practice" Oxford University Press: New Delhi, 2014.		
3.	Dutt P. Kiranmai and Rajeevan Geeta, "Basic Communication Skills", Foundation Books, 2013.		



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B.E. / B.Tech.	B23MAT101 - MATRICES AND	L	т	Р	С
	DIFFERENTIAL CALCULUS				
	(Common to all Branches)	3 1	1	0	4

Course Objectives		
1.	To develop the use of matrices that is needed by engineers for practical applications.	
2.	To understand the concept of functions of several variables.	
3.	To recognize and classify ordinary differential equations.	
4.	To apply the concept of ordinary differential equations in engineering disciplines.	
5.	To learn the applications of Laplace transforms in engineering.	

Eigen values	and Eigenvectors of a real matrix - Characteristic equation - Properties of Eigen	values
and Eigenveo	ctors – Cayley Hamilton theorem – Quadratic form: Nature, Reduction to canonical t	ⁱ orm by
orthogonal tra	ansformation	

MATRICES

Partial differentiation –Total derivative – Jacobians – Taylor's series expansion for functions of two variables – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers

UNIT - III	ORDINARY DIFFERENTIAL EQUATIONS	12

Higher order linear ordinary differential equations with constant coefficients - Method of variation of parameters - Simultaneous differential equations

UNIT - IV APPLICATIONS OF ORDINARY DIFFERENTIAL EQUATIONS

Solution of specified differential equations connected with electric circuits - Law of Natural growth and decay - Simple harmonic motion (Differential equations and associated conditions need to be given)

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UNIT - V

LAPLACE TRANSFORM

12

Existence conditions - Properties (excluding proofs) - Transform of standard functions -Transforms of derivatives and integrals - Inverse Laplace transform - Applications to solution of linear second order ordinary differential equations with constant coefficients

Total Instructional hours : 60

	Course Outcomes : Students will be able to			
CO1	Make use of Eigen values and Eigen vectors to reduce the quadratic form into canonical form and to find the powers of a square matrix.			
CO2	Construct maxima and minima problems.			
CO3	Solve differential equations which existing in different engineering disciplines.			
CO4	Develop the applications of differential equations in various engineering field.			
CO5	Apply Laplace transform and inverse transform to solve differential equations with constant coefficients.			

Text Books			
1.	Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 43 rd Edition, 2015.		
2.	Bali N., Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media - An imprint of Lakshmi Publications Pvt., Ltd., New Delhi, 7 th Edition, 2015.		
3.	Kreyszig Erwin, "Advanced Engineering Mathematics ", John Wiley and Sons, 10 th Edition, New Delhi, 2015.		
4.	George B. Thomas, Joel Hass, Christopher Heil, Maurice D. Weir, "Thomas' Calculus", Pearson, 14 th Edition, 2018.		

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Reference Books			
1.	Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5 th Edition, 2019.		
2.	Srimantha Pal and Bhunia, S.C, "Engineering Mathematics" Oxford University Press, 2015.		
3.	Ramana B V., "Higher Engineering Mathematics", Tata Mc Graw Hill Publishing Company, New Delhi, 2017.		
4.	Veerarajan T., "Engineering Mathematics for Semester I and II", Tata Mc Graw Hill Publishing Company, New Delhi, 2019.		
5.	Gean Duffy., "Advanced Engineering Mathematics with MATLAB", A CRC Press Company, Boca Raton London, New York Washington, D.C, 2 nd edition 2009. (Free e-book downloaded from www.EasyEngineering.net.pdf).		





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B.E / B.Tech	B23MET101 – ENGINEERING GRAPHICS	L	Т	Ρ	С
	(Common to All)	2	2	0	4

Course Objectives		
1.	Understand the conventions and method of Engineering drawing.	
2.	Construct and interpret the basic Engineering drawings.	
3.	Improve their visualization skills so that they can apply these skills in new product development.	
4.	Enhance their technical communication skill in the form of communicative drawings.	
5.	Comprehend the theory of projection.	

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION)

2

Importance of graphics in Engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning

UNIT -	I
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PLANE CURVES AND FREE HANDSKETCHING

14

Basic Geometrical constructions, Curves used in Engineering practices-Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves. Visualization concepts and Free Hand sketching: Visualization principles – Representation of Three-Dimensional objects – Layout of views- Free hand sketching of multiple views from pictorial views of objects

UNIT - II

PROJECTION OF POINTS, LINES AND PLANE SURFACE

Orthographic projection- principles-Principal planes-First angle projection-Projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes- Determination of true lengths and true inclinations by rotating line method and trapezoidal method and traces Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method

UNIT - III

PROJECTION OF SOLIDS

14

14

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to both the principal planes by rotating object method and auxiliary plane method

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UNIT - IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES

Sectioning of solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones

UNIT - V ISOMETRIC AND PERSPECTIVE PROJECTIONS

14

3

14

Principles of isometric projection – isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems. Perspective projection of simple solids-prisms, pyramids and cylinders by visual ray method

COMPUTER AIDED DRAFTING

Introduction to drafting packages and demonstration of their use Basic Geometrical constructions using AUTOCAD

Total Instructional hours: 75

	Course Outcomes : Students will be able to			
CO1	Construct the basic Engineering curves and freehand sketching of basic geometrical constructions and multiple views of objects.			
CO2	Draw problems related to projections of points, straight lines, planes and solids.			
CO3	Build the projection of simple solids.			
CO4	Apply the knowledge acquired on practical applications of sectioning and development of solids.			
CO5	Construct simple solids and its sections in isometric view and projections and to draw its perspective views.			

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Text Books					
1.	K.V.Natarajan, "A text book of Engineering Graphics", 28 th Edition, Dhana Lakshmi Publishers, Chennai, 2015.				
2.	N.D. Bhatt and V.M. Panchal, "Engineering Drawing", Charotar Publishing House, 53 rd Edition, 2014.				

Reference Books			
1.	K. Venugopal and V.Prabhu Raja, "Engineering Graphics", New Age International Publishers, 2017.		
2.	K.R.Gopalakrishna., "Engineering Drawing" (Vol. I & II combined) Subhas Publications, Bangalore, 2018.		
3.	N.S Parthasarathy and Vela Murali, "Engineering Drawing", Oxford University Press, 2015.		



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	B23HST101 - தம'ழா மரபு	1	0	0 0

மொழி மற்றும் இலக்கியம்

இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் அறம் - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் - தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளாச்சியில் பாரதியாா் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

மரபு - பாறை ஒவியங்கள் முதல் நவீன ஒவியங்கள் வரை - சிற்பக்கலை அலகு - II

நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினா் மற்றும் அவா்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தோ் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனையில் திருவள்ளுவர் சிலை - இசைக் கருவிகள் - மிருதங்கள், பறை, வீணை, யாழ், நாதஸ்வரம் -தமிழாகளின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

அலகு - III

நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

தமிழர்களின் திணைக் கோட்பாடுகள் <u>அல</u>கு - IV

தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழாகள் போற்றிய அறக்கோட்பாடு - சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் - சங்ககால நகரங்களும் துறை முகங்களும் - சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல் கடந்த நாடுகளில் சோழர்களின் வெற்றி

அலகு - V

இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு

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இந்திய விடுதலைப் போரில் தமிழாகளின் பங்கு - இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டில் தாக்கம் -சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு - கல்வெட்டுகள், கையெழுத்துப் படிகள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

மொத்தம் - 15 காலங்கள்

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<u>அலகு</u> - I

	Text - Cum - Reference Books
1.	தமிழக வரலாறு - மக்களும் பண்பாடும் - கே.கே. பிள்ளை (வெளியீடு - தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்)
2.	கணினித் தமிழ் - முனைவா் இல.சுந்தரம் (விகடன் பிரசுரம்)
3.	கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4.	பொருநை - ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)
5.	Social Life of Tamils (Dr. K.K. Pillay) A joint publication of TNTB & ESC and RMRL - (in print)
6.	Social Life of the Tamils - The Classical Period (Dr. S. Singaravelu) (Published by : International Institute of Tamil Studies.
7.	Historical Heritage of the Tamils (Dr. S.V. Subatamanian, Dr. K.D. Thirunavukkarasu) (Published by : International Institute of Tamil Studies).
8.	The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by : International Institute of Tamil Studies).
9.	Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by : Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10.	Studies in the Histroyb of India with Special Reference to Tamil Nadu (Dr. K.K. Pillay) (Published by : The Author)
11.	Porunai Civilization (Jointly Published by : Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12.	Journey of Civilization Indus to Vaigai (R. Balakrishnan) (Published by : RMRL) - Reference Book.

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R E / R Tach	B23HST101 - HERITAGE OF TAMILS	L	т	Р	С
D.E. / D. Iecii.	(Common to all Branches)	1	0	0	1

UNIT - I

LANGUAGE AND LITERATURE

Language Families in India - Dravidian Languages – Tamil as aClassical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan

UNIT - II

HERITAGE - ROCK ART PAINTINGS TO MODERN ART - SCULPTURE

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making -- Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils

UNIT - III

FOLK AND MARTIAL ARTS

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils

UNIT - IV

THINAI CONCEPT OF TAMILS

Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas

UNIT - V CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE 3 Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books Total Instructional hours : 15

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	Text - Cum - Reference Books
1.	தமிழக வரலாறு - மக்களும் பண்பாடும் - கே.கே. பிள்ளை (வெளியீடு - தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்)
2.	கணினித் தமிழ் - முனைவா் இல.சுந்தரம் (விகடன் பிரசுரம்)
3.	கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4.	பொருநை - ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)
5.	Social Life of Tamils (Dr. K.K. Pillay) A joint publication of TNTB & ESC and RMRL - (in print)
6.	Social Life of the Tamils - The Classical Period (Dr. S. Singaravelu) (Published by : International Institute of Tamil Studies.
7.	Historical Heritage of the Tamils (Dr. S.V. Subatamanian, Dr. K.D. Thirunavukkarasu) (Published by : International Institute of Tamil Studies).
8.	The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by : International Institute of Tamil Studies).
9.	Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by : Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10.	Studies in the Histroyb of India with Special Reference to Tamil Nadu (Dr. K.K. Pillay) (Published by : The Author)
11.	Porunai Civilization (Jointly Published by : Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12.	Journey of Civilization Indus to Vaigai (R. Balakrishnan) (Published by : RMRL) - Reference Book.

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B.E. / B.Tech.	B23CHI101 - ENGINEERING CHEMISTRY		т	Р	С
	(Common to all Branches)	3	0	2	4

Course Objectives				
1.	To make the students conversant with boiler feed water requirements, related problems, water treatment and inculcate practical skills in the water quality analysis.			
2.	To make the students conversant with basics of polymer chemistry.			
3.	To make the students conversant with basic of electrochemical reactions, corrosion and induce experimental skills in the electro-analytical techniques.			
4.	To make the student acquire sound knowledge of energy devices.			
5.	To develop an understanding of the basic concepts of nano materials.			

ER TECHNOLOGY

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Hardness of water : Types, expression of hardness and their units, hardness problems, boiler troubles - scale and sludge, caustic embrittlement, boiler corrosion, priming and foaming

Treatment of Boiler feed water : Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning)

External treatment : Ion exchange process, Zeolite process

Desalination of brackish water : Reverse osmosis - municipal water treatment, break point chlorination Determination of alkalinity in water sample, Determination of total, temporary & permanent hardness of water by EDTA method. Estimation of iron content of the water sample using spectrophotometer

UNIT - IIPOLYMERS9Polymers :Definition, polymerization, types - addition and condensation polymerization, free radical
mechanism - tacticity – biodegradable polymer (PHBV) and conducting polymer (poly-aniline)radicalPlastics :Classification, preparation, properties and uses of PVC, teflon, nylon-6, 6 and epoxy resin
Rubber :Vulcanization of rubber, synthetic rubbers -n-butyl rubber and SBRMoulding :Ingredients - compression and Injection

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UNIT - III

ELECTROCHEMISTRY AND CORROSION

Electrochemistry : Redox reaction, electrode potential - oxidation potential, reduction potential, Nernst equation (derivation) - measurement and applications - electrochemical series and its significance **Corrosion :** causes - types-chemical and electrochemical corrosion (galvanic and differential aeration), corrosion control - electrochemical protection (sacrificial anodic method and impressed current cathodic method)

Estimation of iron content of the given solution using potentiometer, Conductometric titration of strong acid vs strong base, Estimation of copper in brass

UNIT - IV

ENERGY DEVICES

Batteries : Types of batteries – primary (alkaline battery) and secondary battery (lead acid battery, lithium-ion-battery), Fuel Cells ($H_2 - O_2$ fuel cell)

Super Capacitors : Principle, construction, working and applications

Photo voltaic cell : Solar cells - principle, construction, working and applications

UNIT - V

NANOCHEMISTRY

Basics: Distinction between molecules, nanoparticles and bulk materials- surface area to volume ratio **Synthesis**: Top-down process (ball milling) - Bottom-up process (chemical vapour deposition and sol-gel method)

Properties of nano materials - Optical, electrical, thermal and mechanical

Applications of nano materials - Medicine, Industries, electronics and biomaterials

Total Instructional hours : 60

	Course Outcomes : Students will be able to			
CO1	Determine the characterization of water and quantitative analysis of alkalinity, hardness and Iron. (K5)			
CO2	Develop the basics of polymer chemistry. (K3)			
CO3	Interpret the principles of electrochemical reactions, corrosion and estimation of copper in Alloy. (K5)			
CO4	Apply the concepts of energy devices and its engineering applications. (K3)			
CO5	Organize the basics of Nano chemistry and its applications. (K3)			

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	Text Books
1.	Dara, S S and Umare, S S, "A Textbook of Engineering Chemistry", Chand S & Company Ltd., New Delhi, 2015.
2.	Jain, P C and Monika Jain, "Engineering Chemistry" Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 2015
3.	Vogel's Textbook of Quantitative Chemical Analysis, 8 th edition, 2014.

	Reference Books
1.	Friedrich Emich, "Engineering Chemistry", Scientific International Pvt. Ltd., New Delhi, 2014.
2.	Prasanta Rath, "Engineering Chemistry", Cengage Learning India Pvt. Ltd., Delhi, 2015.
3.	Shikha Agarwal, "Engineering Chemistry - Fundamentals and Applications", Cambridge University Press, Delhi, 2015.
4.	Charles P. Poole and Frank J. Owens, "Introduction to nanotechnology", John Wiley Sons, New Jersey, 2003.

Equipment Needed for 30 Students

- 1. Conductivity Meter-10
- 2. Potentiometer-10
- 3. Spectrophotometer-02
- 4. Electronic Balance-01



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	B23CSI102 - PROBLEM SOLVING AND	L	т	Р	С
B.E.	PYTHON PROGRAMMING	_	_		
	(Common to AERO, AGRI, BT and MECH)	3	0	2	4

	Course Objectives			
1.	To develop python programs with conditional statements and loops.			
2.	To learn how to use strings, functions and pass arguments in Python.			
3.	To use python data structures such as lists, tuples, and dictionaries.			
4.	To use file concepts and to build a package using Python modules for reusability.			
5.	To learn the fundamentals of data manipulations with Python.			

Introduction : Python basics and its scripting modes – Variables, Operators - Control Structures : if, if - else, nested if, if - elif ladder statements - Iterative statements : while, for, Nested loops, else in loops, break, continue and pass statements

INTRODUCTION TO PYTHON PROGRAMMING

STRINGS AND FUNCTIONS

Strings: Formatting, Comparison, Slicing, Splitting, Stripping, Negative indices, String functions. Regular expression: Matching the patterns, Search and replace. Functions: Types, parameters, arguments: positional arguments, keyword arguments, parameters with default values, functions with arbitrary arguments

UNIT - III

UNIT - I

UNIT - II

COLLECTIONS

List : Create, Access, Slicing, Negative Indices, List Methods, and comprehensions, Tuples : Create, Indexing and Slicing, Operations on tuples. Dictionary: Create, add, and replace values, operations on dictionaries

UNIT - IV

SETS AND FILE HANDLING

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Sets: Create and operations on set, Files: Manipulating files and directories, text files: reading / writing text and numbers from / to a file; creating and reading a formatted file (csv or tab separated)

UNIT - V

MODULES AND PACKAGES

Modules: Importing module, standard modules, executing modules. Packages: Importing Packages, simple programs using built-in functions of packages like pandas, jumpy, matplotlib

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List of Experiments			
Expt. No.	Description of the Experiments		
	Pro	grams Using Simple Statements	
1	a.	Exchange the values of two variables,	
1.	b.	Circulate the values of n variables,	
	C.	Distance between two points.	
	Pro	ograms Using Conditionals and Iterative Statements	
2	a.	Number Series	
۷.	b.	Number Patterns	
	C.	Pyramid Pattern	
	Pro	grams Using built-in and user defined Functions	
3	a.	Factorial of a Number	
5.	b.	Largest Number in a list	
	C.	Area of Shape	
	Pro	ograms using Strings	
	a.	Reversing a String	
4.	b.	Checking Palindrome in a String	
	C.	Counting Characters in a String	
	d.	Replacing Characters in a String	
	Op	erations of Lists	
	a.	Basic Operations (Insertion, Updating, deletion, accessing, List Comprehensions)	
5.	b.	Implement linear search and binary search using list.	
	C.	Matrix operations using Nested List.	
	d.	Implement Merge, Bubble and Insertion sort	

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	Cre	eate a tuple and perform its operations for the following:	
	a.	Basic Operations (Insertion, Updating, deletion, accessing)	
6.	b.	Items present in a library	
	C.	Components of a car	
	d.	Materials required for construction of a laboratory	
	Ор	erations of Dictionaries	
7.	a.	Python program to create a dictionary with integer keys, and print the keys, values & key-value pairs	
	b.	Python program to randomize (shuffle) values of dictionary	
Q	Ор	erations of Sets	
0.	a.	Basic operations of set (Membership, Operations and Modifications)	
	Pro	ograms using File Handling	
q	a.	Copy from one file to another.	
5.	b.	Word count	
	C.	Longest word	
	Pyt	hon programs using Time and Calendar related functions	
10.	a.	Print the current time using time module.	
	b.	Display the calendar of given month of the year using calendar module.	
11.	Implementing programs using written modules and Python Standard Libraries (pandas, numpy. Matplotlib, scipy)		
		Total Instructional hours: (45+15) = 60	

	Course Outcomes : Students will be able to
CO1	Construct Python programs using iterative and conditional statements.
CO2	Experiment with user-defined functions and Strings.

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CO3	Build python programs with list, tuples, dictionaries and set.
CO4	Develop Python application using file operations and modules.
CO5	Apply data manipulation concepts using libraries.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS

SI. No.	Description of the Equipment	Quantity required (Nos.)
1.	HP Make, Core i5, 11 th Generation, 16GB RAM PCs, Operating systems: Windows* 10 or later, macOS, and Linux. Python* version: 3.10.X	30

	Text Books
1.	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2 nd Edition, Updated for Python 3, Shroff / O 'Reilly Publishers, 2016
2.	Reema Thereja, "Python Programming using Problem Solving Approach", 4 th Impression, Oxford University Press, 2019.
3.	Python Course Data Analysis with Python by Bernd Klein, 2021.

	Reference Books
1.	John V Guttag, "Introduction to Computation and Programming Using Python", Revised and expanded Edition, MIT Press, 2013.
2.	Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python : An Inter-disciplinary Approach", Pearson India Education Services Pvt. Ltd, 2016.
3.	Timothy A. Budd, "Exploring Python", Mc-Graw Hill Education (India) Private Ltd, 2015.
4.	Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012.

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B.E. / B.Tech	B23MEP101 – BASIC WORKSHOP	L	т	Р	С
	PRACTICES LABORATORY (GROUP - A & B)	0 0	4	2	
	(Common to all Branches)				

Course Objectives

Drawing pipe line plan; laying and connecting various pipe fittings used in common household
plumbing work, sawing, planning, making joints in wood materials used in common household wood work.

	Welding various joints in steel plates using arc welding work; machining various simple processes
2.	like turning, drilling, tapping in parts; assembling simple mechanical assembly of common
	household equipments, making a tray out of metal sheet using sheet metal work.

3. To provide exposure to the students with hands on experience on various basic Engineering practices in Electrical Engineering.

4. To provide exposure to the students with hands on experience on various basic Engineering practices in Electronics Engineering.

GROUP – A (CIVIL & MECHANICAL)

I Civil Engineering Practices

Plumbing Works

Making basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings

Carpentry

Preparation of wooden joints by sawing, planning and cutting

1.	Planning & Polishing operation
2.	Half lap joint
3.	Cross lap joint

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	Mechanical Engineering Practices	18	
Weldin Study and re	Welding Workshop Study of welding tools and equipment's - Study of various welding methods - Instruction of BI standards and reading of welding drawings.		
Exerc	ise in arc welding for making		
1.	Lap joint		
2.	Butt joint		
3.	Demonstration of gas welding and cutting.		
Machi	ne Shop		
1.	Drilling and Tapping		
2.	Lathe Exercise – Facing operation		
3.	Lathe Exercise – Straight turning and Chamfering		
Sheet	metal		
Making	g of small parts using sheet metal		
1.	Making of Square Tray		

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Expt. No.	Description of the Experiments
1.	Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2.	Fluorescent lamp and Stair case wiring.
3.	Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit.
4.	Measurement of energy using single phase energy meter.
5.	Measurement of resistance to earth of an electrical equipment.
6.	Study of Electronic components and equipment's – Resistor color coding
7.	Measurement of AC signal parameter (peak-peak, rms period, frequency) using CRO.
8.	Study of logic gates AND, OR, EX-OR and NOT.
9.	Soldering & desoldering practices.
10.	Study of Fan, Iron Box, Emergency Lamp, Telephone and FM Radio.

GROUP – B (ELECTRICAL & ELECTRONICS)

Total Instructional hours : 60

	Course Outcomes : Students will be able to
CO1	Explain the pipe connections and identify the various components used in plumbing.
CO2	Develop simple wooden joints using wood working tools and simple components using lathe and drilling machine.
CO3	Construct simple lap, butt and tee joints using arc welding equipment and simple parts using sheet metal.
CO4	Construct Residential house wiring, Fluorescent lamp wiring and Stair case wiring.
CO5	Measure electrical quantities such as voltage, current, power & power factor in RLC Circuit, resistance to earth, AC signal parameter (peak-peak, RMS period, frequency) and ripple factor.
CO6	Examine logic gates (AND, OR, EX-OR and NOT), Electronic components and equipment's.

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R - 2023

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS				
		GROUP – A (CIVIL & MECHANICAL)		
SI. No.		Description of Equipment	Quantity required	
1.	Asso pipes	rted components for plumbing, Consisting of metallic pipes, plastic s, flexible pipes, couplings, unions, elbows, plugs and other fittings.	15	
2.	Carp	entry vice (fitted to work bench)	15	
3.	Stan	dard woodworking tools	15	
4.	Mode	els of industrial trusses, door joints, furniture joints	5	
5.	Powe	er Tools:		
	(a)	Rotary Hammer	2	
	(b)	Demolition Hammer	2	
	(c)	Circular Saw	2	
	(d)	Planer	2	
	(e)	Hand Drilling Machine	2	
	(f)	Jigsaw	2	
6.	Arc v	velding transformer with cables and holders	5	
7.	Weld	ing booth with exhaust facility	5	
8.	Weld etc.	ing accessories like welding shield, chipping hammer, wire brush,	5	
9.	Охус	en and acetylene gas cylinders, blow pipe and other welding outfit.	2	
10.	Cent	re lathe	2	
11.	Hear	th furnace, anvil and smithy tools	2	
12.	Moul	ding table, foundry tools	2	
13.	Powe	er Tool: Angle Grinder	2	
14.	Stud	y-purpose items: Centrifugal pump, Airconditioner	1	

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GROUP – B (ELECTRICAL & ELECTRONICS)			
SI. No.	Description of Equipment	Quantity required	
1.	Assorted Electrical Components for House Wiring	15 sets	
2.	Electrical Measuring Instruments	10 sets	
3.	Iron Box	1	
4.	Fan and Regulator	1	
5.	Emergency Lamp	1	
6.	Megger	1	
7.	Digital Live Wire Detector	2	
8.	Soldering Guns	10	
9.	Assorted Electronic Components for Making Circuits	50	
10.	Multipurpose PCBs	10	
11.	Multi Meters	10	
12.	Telephone	2	
13.	FM radio	2	
14.	Regulated Power Supply	2	
15.	CRO (30MHz)	2	
16.	Bread board	10	
17.	Digital IC types (IC 7432, IC 7408, IC 7400, IC 7404, IC 7402, IC 7486)	Each 10	

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Semester – II

KIT - Kalaignarkarunanidhi Institute of Technology

	B23MAT201 - INTEGRAL CALCULUS AND	L	т	Р	С
B.E. / B.Tech.	COMPLEX ANALYSIS				
	(Common to all Branches)	3	1	0	4

	Course Objectives		
1.	To recognize various techniques of integration.		
2.	To apply integration techniques in evaluating area and volume of solids.		
3.	To develop the use of Vector calculus in two and three dimensional spaces.		
4.	To demonstrate understanding of the basic concepts of complex differentiation.		
5.	To understand Cauchy theorem and Cauchy integral formulae and apply these to evaluate complex contour integrals.		

UNIT - I

INTEGRAL CALCULUS

Riemann sum – Definite and Indefinite integrals - Substitution rule (Exponential, logarithmic, Trigonometric functions) – Integration by parts – Integration of Rational functions by Partial fraction

UNIT - II

MULTIPLE INTEGRALS

Double integrals : Double integrals in Cartesian coordinates - Double integrals in Polar coordinates – Area enclosed by plane curves – Triple integrals: Evaluation of triple integrals - Volume as triple integral (Simple problems)

UNIT - III

VECTOR CALCULUS

Gradient and directional derivative - Divergence and curl - Solenoidal and Irrotational vector fields - Green's theorem in a plane, Gauss divergence theorem and Stoke's theorem (excluding proofs) – Verification of theorem and applications (for cubes and rectangular parallellopipeds)

UNIT - IV

COMPLEX DIFFERENTIATION

12

12

Analytic functions - Cauchy - Riemann equations (excluding proof) – Properties of analytic function – Harmonic conjugate - Construction of analytic function by Milne Thomson method – Bilinear transformation

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12

UNIT - V COMPLEX INTEGRATION

Cauchy's integral theorem – Cauchy's integral formula – residues - Cauchy's Residue theorem – Evaluation of real integrals – Stereographic projection – Use of circular contour and semicircular contour (excluding poles on real axis)

Total Instructional hours : 60

	Course Outcomes : Students will be able to
CO1	Develop Fundamental Theorem of Calculus, techniques of Integration such as substitution, partial fractions and integration by parts.
CO2	Make use of integration to compute area and volume.
CO3	Apply the line, surface and volume integrals for verification of Green's, Gauss and Stokes theorems.
CO4	Develop an understanding of the standard techniques of complex variable theory in particular analytic function
CO5	Classify and compare the different types of Crystals, their structures and its defects.

Text Books				
1.	Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 43 rd Edition, 2014.			
2.	Kreyszig Erwin, "Advanced Engineering Mathematics ", John Wiley and Sons, 10 th Edition, New Delhi, 2015.			
3.	George B. Thomas , Joel Hass , Christopher Heil , Maurice D. Weir, "Thomas' Calculus", Pearson, 14 th Edition, 2018.			

	Reference Books
1.	Bali N., Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media - An imprint of Lakshmi Publications Pvt., Ltd., New Delhi, 7th Edition, 2015.
2.	Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5 th Edition 2019.

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3.	O'Neil, P.V.,"Advanced Engineering Mathematics", Cengage Learning India Pvt. Ltd, New Delhi, 7 th Edition 2017.
4.	Sastry, S.S, "Engineering Mathematics", Vol. I & II, PHI Learning Pvt. Ltd, 4 th Edition, New Delhi, 2014.
5.	Wylie, R.C. and Barrett, L.C., "Advanced Engineering Mathematics", (Tata McGraw Hill Education Pvt. Ltd), 6 th Edition, New Delhi, 2012.
6.	Gean Duffy., "Advanced Engineering Mathematics with MATLAB", A CRC Press Company, Boca Raton London, New York Washington, D.C, 2 nd edition 2009. (Free e-book downloaded from www.EasyEngineering.net.pdf)





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B.E. / B.Toch. B23HST201- தமிழரும் தொழில்நட்பமும் L T P C சிலகு - I நெசவு மற்றம் பானைத் தொழில்நட்டம் 3 சங்க காலத்தில் நெசவுத் தொழில் - பானைத் தொழில்நட்டம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களி க்றல் குறியீடுகள். 3 சங்க காலத்தில் வடிவமைப்பு மற்றம் கட்டிடத் தொழில்நட்டம் 3 சங்க காலத்தில் வடிவமைப்பு மற்றம் கட்டுபனங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு மற்றிம் கட்டுமனங்கள் & சங்க காலத்தில் வேருட்கள் மனைத் குதல்றில் மேடை அமைப்பு பற்றிய பினங்கன - மாமல்லபர்ச் சிற்பங்களும், கோவில்களும் - சோழிர் காலத்துப் பெருங்கோவில்கள் மற்றும் றி வழிபாட்டுத தலங்கள் - நாயக்கர் காலக் கோவில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மன்னர் மினாட்சி அம்மன் ஆலமம் மற்றும் திருமலை நாயக்கர் மஹால் - செப்புதாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ - சாரோசேளிக் கட்டிடக்கலை 3 சிலகு - II உற்பத்தித் தொழில் நட்டம் 3 அனை - II உற்பத்தித் தொழிற்காலை - இரும்னப் உருவாக்குதல், சென் வரனாற்றிச் என்றுகளாக செப்பு மற்றும் தங்க நாணயங்கள் - மானுயங்கள் - வருவாக்குல், எகு வரனாற்றிச் என்றுகளாக செப்பு மற்றும் தங்க நாணயங்கள் - நானையங்கள் அச்சடித்தல், மனி உருவாக்குது தொழிற்சானலகள் - கல்மணிகள், கன்னாடி மணிகள் - தருமன் மணிகள் - சங்கு மனிகள் - வரம்பது இன்டுகள் - தொல்லியல் சான்றுகள், சில்பதிகாரத்தில் மணிகளின் வகைகள் 3 அனை, ஏரி குளங்கள், மத்த - சோழங்காலத் குறிழித் தம்வின் மனைகள் வகைகள் 3 அனை, ஏரி, குளங்கள், மத்த - சோழங்கி குறில் நீட்டானண்மை சாற்த சென் வான்கைம் சுற்வு - சிலிவில் தமிழ் மற்றம் கணித்தமிழ் வேளாண்மை - சுறிவுசான் வனம் - முத்து மற்றும் மன்னண்மை மற்றத் கேன்திக்குமீத் வரைப் அறிவ							
அலகு - 1 நெதுவு மற்றம் பானைத் தொழில்நட்டம் 3 சங்க காலத்தில் நெசவுத் தொழில் - பானைத் தொழில்நட்டம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள். வடிவமைப்பு மற்றம் கட்டிடத் தொழில்நட்டம் 3 சங்க காலத்தில் மதுவனமப்பு மற்றம் கட்டிடத் தொழில்நட்டம் சங்க காலத்தில் வடிவமைப்பு மற்றம் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கன - மாமல்லபரச் சிற்பங்களும், கோவில்களும் - சோழர் காலத்துப் பெருங்கோவில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் காலக் கோவில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ - சாரோசெனிக் கட்டிடக்கலை 3 சல்கு - III உற்பத்துத் தொழில் நுட்டம் தலங்கள் - தால்லியல் - இரும்புத் தொழில் நுட்டம் 3 கப்லக் கலை - உலோகனியல் - இரும்புத் தொழில் நுட்டம் தொழிற்சாலைகள் - கல்மனிகள், கண்ணாடி மணிகள் - கருமன் மனிகள் - சங்கு மனிகள் - எலும்பு தொழிற்சாலைகள் - கல்மனிகள், கண்ணாடி மணிகள் - கருமன் மனிகள் - சங்கு மனிகள் - எலுப்பு துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மனிகள் வகைகள் வரலாற்றுக் சாஸ்விடல் சான்றுகள் - சிலப்பதிகாரத்தில் மனிகள் வகைகள் - கால்நடைகள் - கல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் முக்கியத்துவம் - கால்நடை பராமரிய - கால்நடைய அறிவு - அறிவுசார் சமலம் - வால்நடை தாறிலு கார்த் தமிழ் நர்புற் கணித்தமிழ் வேனிவாருட்கள் - கடல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் முக்கியத்தலிழ் வேறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் மற்றும் கணித்தவற்ற - இன்தொடுட்கள் - கல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் கணித்தவற்ற - வரல்தனம் - வளிக்கம் - தமிழ் இனையக் கல்விக் கழகல் - தினையத்தில் தமிழ் வென்பொருட்கள் உருவாக்கம் - தமிழ் இனையக் கல்விக் கழகம் - தமிழ் மின் நாலகம் - இணையத்தில் தமிழ அதராதிகள் - சேற்க	B.E. / B.Tech	· B23HST201- தமிழரும் தொழில்நுட்பமும்	L 1	Т 0	P 0	C 1	
சங்க காலத்தில் நெசவுத் தொழில் - பானைத் தொழில்நுட்டம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள்.	அலகு - I	நெசவு மற்றும் பானைத் தொழில்நுட்ப	D	1		3	
මාலகு - II வாஷவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்டம் 3 சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமாளங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கன் - மாமல்லபுரச் சிற்பங்களும், கோவில்களும் - சோழர் காலத்துப் பெருங்கோவில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் காலக் கோவில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்பன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையிச் இந்தோ - சாரோசெனிக் கட்டிடக்கலை 3 මலகு - III உற்பத்தித் தொழில் நட்டம் 3 வலகள் - கல் உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருவாக்குதல், எகு வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மனி உருவாக்குதல் தொழிற்தாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - கடுமண் மணிகள் - சங்கு மணிகள் - எலும்பு துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள் 3 அனை, ஏரி, குளங்கள், மதகு - சோழர்காலக் குமிழித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்ப - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் முக்கியத்திலம் - வோல்நடை சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் முத்துக் குளித்தல் - பெரங்கடல் குறித்த பண்டைய அறிவு - அறிவுசால் தமிழ் வளர்ச்சி - தமிழ் நால்களை மின் பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழல் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அதராதிகள் - சொற்குவைத் திட்டம் 3 வுனிலின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் மின் நூலகம் - இணையத்தில் தலிழ் அதராதிகள் - சொற்குவத் திட்டம் 3	சங்க காலத்தி கீறல் குறியீடு	ல் நெசவுத் தொழில் - பானைத் தொழில்நுட்பம் - கருப்பு சிவப்பு ட கள்.	பாண்டா	ங்கள் - ட	பாண்டங்	பகளிஎ	
சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டூப் பொருட்களில் வடிவமைப்பு சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் - சிலப்புதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்க - மாமல்லபுரச் சிற்பங்களும், கோவில்களும் - சோழர் காலத்துப் பெருங்கோவில்கள் மற்றும் பிற வழிபாட்டு தலங்கள் - நாயக்கர் காலக் கோவில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்ம ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - சேட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில இந்தோ - சாரோசெனிக் கட்டிடக்கலை அலகு - III <u>உற்பத்தித் தொழில் நட்டம்</u> 3 கப்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருவாக்குதல், எ∴்கு வரலாற்றுச் சான்றுகளாக சேம்பு மற்றும் தங்க நாணயங்கள் - நானயங்கள் அச்சடித்தல் - மணி உருவாக்குத தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சடுமண் மணிகள் - சங்கு மணிகள் - எலும்பு துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள் அலகு - IV <u>வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நட்டம்</u> 3 அணை, ஏரி, குளங்கள், மத்கு - சோழர்காலக் குமிழித் தும்பின் முக்கியத்துவம் - கால்நடை பராமரிப - காலந்டைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் முத்துக்குறித்தல் - பெருங்கடல் குறித் பண்டைய அறிவு - அறிவுசார் சமூகம் அலிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நிலகளை மின் பதிப்பு சேய்தல் - தமிடி மென்பொருட்கள் - தோறிலு தலில் இனிக் கழகம் - தமிழ் மின் நாலகம் இணையத்தில் தமிழ அகராதிகள் - சொற்குவைத் திட்டம்	அலகு - II	வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்				3	
அலகு - III உற்பத்தித் தொழில் நுட்டம் 3 கம்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருவாக்குதல், எகு வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்குது தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - கடுமண் மணிகள் - சங்கு மணிகள் - எலும்பூ துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள் 3 அலகு - IV வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்டம் 3 அனை, ஏரி, குளங்கள், மதகு - சோழர்காலக் குமிழித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப் - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந் செயல்பாடுகள் - கடல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் முத்துக் குளித்தல் - பெருங்கடல் குறித் பண்டைய அறிவு - அறிவுசார் சமூகம் 3 அலைது - V அறிவியல் தமிழ் மற்றும் கணித்தமிழ் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின் பதிப்பு செய்தல் - தமிழ மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ அகராதிகள் - சொற்குவைத் திட்டம் 3	- மாமல்லபுரச் சிற்பங்களும், கோவில்களும் - சோழர் காலத்துப் பெருங்கோவில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் காலக் கோவில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ - சாரோசெனிக் கட்டிடக்கலை						
கப்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருவாக்குதல், எ.:கு வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கு தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - எலும்பு துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள் அலகு - IV வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்டம் 3 அணை, ஏரி, குளங்கள், மதகு - சோழர்காலக் குமிழித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப் - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந் செயல்பாடுகள் - கடல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் முத்துக் குளித்தல் - பெருங்கடல் குறித் பண்டைய அறிவு - அறிவுசார் சமூகம் அலகு - V வறிவியல் தமிழ் மற்றும் கணித்தமிழ் 3 அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின் பதிப்பு செய்தல் - தமிடி மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ அகராதிகள் - சொற்குவைத் திட்டம்	அலகு - III	உற்பத்தித் தொழில் நுட்பம்				3	
இலகு - IV வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்டம் 3 அணை, ஏரி, குளங்கள், மதகு - சோழர்காலக் குமிழித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப் - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் முத்துக் குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார் சமூகம் 3 இலகு - V அறிவியல் தமிழ் மற்றும் கணித்தமிழ் 3 அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின் பதிப்பு செய்தல் - தமிழ மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ அகராதிகள் - சொற்குவைத் திட்டம்	வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - எலும்புத் துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள்						
அணை, ஏரி, குளங்கள், மதகு - சோழா்காலக் குமிழித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப் - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் முத்துக் குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார் சமூகம் விலகு - V விறிவியல் தமிழ் மற்றும் கணித்தமிழ் அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின் பதிப்பு செய்தல் - தமிழ மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ அகராதிகள் - சொற்குவைத் திட்டம்	அலகு - IV	வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்	நுட்பம்)		3	
அலகு - V அறிவியல் தமிழ் மற்றும் கணித்தமிழ் 3 அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின் பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம் 3 மாத்தம் - 15 காலங்கள் 5	அணை, ஏரி, குளங்கள், மதகு - சோழா்காலக் குமிழித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சாா்ந்த செயல்பாடுகள் - கடல்சாா் அறிவு - மீன் வளம் - முத்து மற்றும் முத்துக் குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசாா் சமூகம்						
அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின் பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம் மொ த்தம் - 15 காலங்கள்	ി രു - V	அறிவியல் தமிழ் மற்றும் கணித்தமிழ்				3	
மொத்தம் - 15 காலங்கள்	அறிவியல் தட மென்பொருட்க அகராதிகள் -	றிழின் வளா்ச்சி - கணித்தமிழ் வளா்ச்சி - தமிழ் நூல்களை ம எா் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் ந சொற்குவைத் திட்டம்	ின் பத் தூலகம்	ப்பு செ - இணை	ய்தல் - ாயத்தில்	தமிį றதமிį	
			மொத்	தம் - 1	கால	ங்கள்	

Ryan Approved by BoS Chairman

	Text - Cum - Reference Books			
1.	தமிழக வரலாறு - மக்களும் பண்பாடும் - கே.கே. பிள்ளை (வெளியீடு - தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்)			
2.	கணினித் தமிழ் - முனைவா் இல.சுந்தரம் (விகடன் பிரசுரம்)			
3.	கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)			
4.	பொருநை - ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)			
5.	Social Life of Tamils (Dr. K.K. Pillay) A joint publication of TNTB & ESC and RMRL			
6.	Social Life of the Tamils - The Classical Period (Dr. S. Singaravelu) (Published by : International Institute of Tamil Studies.			
7.	Historical Heritage of the Tamils (Dr. S.V. Subatamanian, Dr. K.D. Thirunavukkarasu) (Published by : International Institute of Tamil Studies).			
8.	The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by : International Institute of Tamil Studies).			
9.	Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by : Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)			
10.	Studies in the Histroy of India with Special Reference to Tamil Nadu (Dr. K.K. Pillay) (Published by : The Author)			
11.	Porunai Civilization (Jointly Published by : Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)			
12.	Journey of Civilization Indus to Vaigai (R. Balakrishnan) (Published by : RMRL) - Reference Book.			

Hyper
Approved by BoS Chairman

KIT - Kalaignarkarunanidhi Institute of Technology

B.E. / B. lech	B23HS1201- TAMILS AND TECHNOLOGY	1	0	0	1
BE / BTech	R23HST201, TAMILS AND TECHNOLOGY	L	т	Ρ	С

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries

UNIT - II	DESIGN AND CONSTRUCTION TECHNOLOGY
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3

3

3

Designing and Structural construction House & Designs in household materials during Sangam Age -Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places -Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal -Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period

UNIT - III MANUFACTURING TECHNOLOGY

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting,steel - Copper and goldCoins as source of history - Minting of Coins – Beads making-industries Stone beads - Glass beads - Terracotta beads -Shell beads/ bone beats - Archeological evidences - Gem stone types described in Silappathikaram

UNIT - IV

AGRICULTURE AND IRRIGATION TECHNOLOGY

Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society

UNIT - V

SCIENTIFIC TAMIL & TAMIL COMPUTING

3

Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project

Total Instructional hours : 15

Approved by BoS Chairman

Text - Cum - Reference Books			
1.	தமிழக வரலாறு - மக்களும் பண்பாடும் - கே.கே. பிள்ளை (வெளியீடு - தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்)		
2.	கணினித் தமிழ் - முனைவா் இல.சுந்தரம் (விகடன் பிரசுரம்)		
3.	கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)		
4.	பொருநை - ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)		
5.	Social Life of Tamils (Dr. K.K. Pillay) A joint publication of TNTB & ESC and RMRL - (in print)		
6.	Social Life of the Tamils - The Classical Period (Dr. S. Singaravelu) (Published by : International Institute of Tamil Studies.		
7.	Historical Heritage of the Tamils (Dr. S.V. Subatamanian, Dr. K.D. Thirunavukkarasu) (Published by : International Institute of Tamil Studies).		
8.	The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by : International Institute of Tamil Studies).		
9.	Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by : Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)		
10.	Studies in the Histroyb of India with Special Reference to Tamil Nadu (Dr. K.K. Pillay) (Published by : The Author)		
11.	Porunai Civilization (Jointly Published by : Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)		
12.	Journey of Civilization Indus to Vaigai (R. Balakrishnan) (Published by : RMRL) - Reference Book.		

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DE	B23MET201 – ENGINEERING MECHANICS	L	т	Р	С
D.C.	(Common to Mech, Aero, Agri)	3	1	0	4

	Course Objectives
1.	To make the students understand the vector and scalar representation of forces and the static equilibrium of particles.
2.	To understand the moment and the equilibrium of rigid bodies in two dimensions and three dimensions.
3.	To make the students understand the properties of surfaces and solids in relation to moment of inertia.
4.	To understand laws of motion, kinetics of particles and their interrelationship.
5.	To make the students understand effect of friction on equilibrium in rigid bodies.

UNIT - I

Introduction – Units and Dimensions – Laws of Mechanics – Principle of transmissibility – Lami's theorem, Parallelogram and triangular Law of forces – Coplanar Forces – rectangular components – Equivalent systems of forces – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space using vector representation

STATICS OF PARTICLES

UNIT - II EQUILI

EQUILIBRIUM OF RIGID BODIES

12

12

Free body diagram – Types of supports – Action and reaction forces – stable equilibrium – Moments and Couples – Varignon's theorem - Moment of a force about a point and about an axis – Scalar components of a moment – Single equivalent force - Couple - Moment of a Couple, Equivalent Couples, Addition of Couples, Resolution of a Given Force into a Force - Couple system – Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions

UNIT - III

PROPERTIES OF SURFACES AND SOLIDS

12

Centroids and centre of mass – Centroids of lines and areas – T section, I section, Angle section and Hollow section by using standard formula – Theorems of Pappus - Area moments of inertia of plane areas – T section, I section, Angle section and Hollow section by using standard formula – Parallel axis theorem and perpendicular axis theorem – Principal moments of inertia of plane areas – Principal axes of inertia – Mass moment of inertia – Mass moment of inertia for cylindrical and spherical solids from first principle

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UNIT - IV

DYNAMICS OF PARTICLES

Kinematics - Rectilinear Motion and Curvilinear Motion of Particles. Kinetics - Newton's Second Law of Motion - Equations of Motions, Dynamic Equilibrium, Energy and Momentum Methods - Work of a Force, Kinetic Energy of a Particle, Principle of Work and Energy, Principle of Impulse and Momentum, Impact of bodies

UNIT - V

FRICTION

The Laws of Dry Friction, Coefficients of Friction, Angles of Friction, Wedge friction, Wheel Friction, Rolling Resistance, Ladder friction

Total Instructional hours : 60

	Course Outcomes : Students will be able to
CO1	Explain the basics and state of particles and understand the vectorial and scalar representation of forces and moments.
CO2	Interpret static equilibrium of particles and rigid bodies in two and three dimensions.
CO3	Identify the properties of surfaces & solids in relation to moment of inertia.
CO4	Illustrate the laws of motion, kinematics and kinetics of particles and their interrelationship.
CO5	Determine the friction and the effects by the laws of friction

	Text Books
1.	Vela Murali, "Engineering Mechanics", Oxford University Press, 2018.
	Beer Ferdinand P, Russel Johnston Jr., David F Mazurek, Philip J Cornwell, Sanjeev Sanghi,
2.	Vector Mechanics for Engineers: Statics and Dynamics, McGraw Higher Education., 12 th Edition,
	2019.

	Reference Books
1.	Hibbeller, R.C., Engineering Mechanics: Statics and Dynamics, 13 th Edition, Prentice Hall, 2013.
2.	Timoshenko S, Young D H, Rao J V and SukumarPati, Engineering Mechanics, 5 th Edition, McGraw Hill Higher Education, 2013.
3.	Meriam J L and Kraige L G, Engineering Mechanics: Statics and Engineering Mechanics: Dynamics, 7 th edition, Wiley student edition, 2013.

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RE / R Tooh	B23CEP201 – SOFT SKILLS	L	Т	Р	С
D.E. / D. Iech.	(Common to all Branches)	2	0	0	0

	Course Objectives
1.	To identify personality using evaluation method.
2.	To encourage creative thinking by practice.
3.	To enrich interpersonal skills through integrated activities.
4.	To develop social and professional etiquette.
5.	To identify and apply employability skills for professional success.

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Introduction t	o soft skills, Familiarize oneself, Self-understanding, SWOT analysis, Goal Setting	

	- 1				

UNIT -	Ш
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LINIT - I

INNOVATIVE THINKING

SELE EVALUATION

6

Divergent thinking, Encourage curiosity, Writing a story, Poster making

UNIT - III	INTERPERSONAL SKILLS	6			
Interpersonal skills - Need & Components - Understanding Intercultural Competence - Team Work-					
Problem Solving Skills - Conflict Management & Resolutions in Workplace, Leadership skills, Managerial					
skills					

 UNIT - IV
 BUSINESS ETIQUETTE
 6

 Define Etiquette - Types and Importance of Workplace Etiquette - Basic Corporate Etiquette - Telephone Etiquette - Meeting & E-mail Etiquette - Customer Service Etiquette
 6

 UNIT - V
 CORPORATE SKILLS
 6

 UNIT - V
 CORPORATE SKILLS
 6

 Work Ethics - Adaptability - Analytical Reasoning - Lateral Thinking - Stress & Time Management
 6

Total Instructional hours : 30



	Course Outcomes : Students will be able to		
CO1	Identify different personalities.		
CO2	Show creative skill in different aspects.		
CO3	Utilize leadership skills with ability to work in a team.		
CO4	Analyze work place etiquette.		
CO5	Develop adequate soft skills required for the workplace.		

	Reference Books
1.	Butterfield, Jeff "Soft Skills for Everyone" Cengage Learning, New Delhi, 2015.
2.	S.Hariharanetal "Soft Skills" MJP Publishers : Chennai, 2010.
3.	Peter, Francis "Soft Skills and Professional Communication" New Delhi : Tata McGraw Hill, 2012. Print.
4.	Meenakshi Raman, Shalini Upadhyay, 'Soft Skills', Cengage Learning India Pvt. Ltd, Delhi, 2018.
5.	M.S. Rao, 'Soft Skills Enhancing Employability', I. K. International Publishing House Pvt. Ltd, New Delhi, 2010
6.	Sabina Pillai, Agna Fernandez, 'Soft Skills and Employability Skills', Cambridge University Press, 2018.
7.	John Peter.A, 'Self – Development and Professional Excellence', Cengage Learning India Pvt. Ltd, Delhi, 2019.

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B.E. / B.Tech.		L	т	Р	С
(Except CSBS)	BZSENITUT - PROFESSIONAL COMMUNICATION	3	0	2	4

	Course Objectives			
1.	To enhance listening and reading ability of learners to comprehend various forms of speech or conversations.			
2.	To develop learners' verbal ability through complex texts and speak effectively in real life and workplace context.			
3.	To make use of grammatical knowledge to enhance fluency.			
4.	To foster learners' ability to write convincing job applications and effective reports.			
5.	To develop learners language proficiency through LSRW skills.			

	UNIT – I	9
Listening	Listening for general information - specific details - conversation - A video (formal & informal); Telephone conversation	udio /
Speaking	Self-Introduction; Introducing a friend; - politeness strategies - mak polite requests & polite offers	ing
Reading	Introduction to technical texts, scientific texts	
Writing	Extended definitions, Writing checklists, Recommendation	
Language development	Gerunds, Infinitives	
Vocabulary development	Technical vocabulary, abbreviations, British & American spelling	
UNIT – II 9		

		Ŭ
Listening	Listening to podcasts, anecdotes / stories / event narration; documen and interviews with celebrities	Itaries
Speaking	Narrating personal experiences / Talking about events and situation	าร
Reading	Reading longer technical texts, Summarizing	

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Writing	Interpreting graphical representations, Writing dialogues about formal and informal contexts
Language development	Use of conjunctions and prepositions
Vocabulary development	Numerical adjectives, Transitional device

UNIT – III 9		
Listening	Listen to a classroom lecture; listening to advertisements about pro	ducts
Speaking	Picture description - describing locations in workplace, Prese product, describing shape, size and weight - talking about quant talking about precautions, discussing advantages and disadvanta making comparisons	enting ities - ages -
Reading	Cause & effect texts, practice in speed reading	
Writing	Process writing, Use of sequence words, Analytical and issue lessays	based
Language development	Subject verb agreement, Pronoun concord / pronoun antecedent	
Vocabulary development	Sequence words, Misspelled words, Content v/s Function words	

UNIT – IV		
Listening	Listening to TED Talks, Educational videos and completing exe based on them	rcises
Speaking	Short speech (Just A Minute) - Extempore and persuasive sp discussing and making plans-talking about tasks-talking about prog	eech, Iress
Reading	Reading for details in personal and professional emails	
Writing	Drafting personal and professional emails, job application - cover résumé preparation, Internship letter	letter,
Language development	Clauses, if conditionals	
Vocabulary development	Finding suitable synonyms, Paraphrasing	

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UNIT – V		
Listening	Listening to debates/ discussions and panel discussions, listen interviews	ing to
Speaking	Making predictions - talking about a given topic, giving opinions & describing a process, discussing safety issues (making recommendation)	facts, ations)
Reading	Reading and understanding technical articles	
Writing	Writing reports, Minutes of meeting, Writing feasibility, survey and industrial reports	
Language development	Reported speech, Active and Passive voice, Impersonal passive, Ic	lioms
Vocabulary development	Verbal analogies, Purpose statements	
	Total Theory Instructional hour	s : 45
	Total Lab Instructional hour	's : 30

	Course Outcomes : Students will be able to	
CO1	Develop listening skills to respond appropriately in general and academic purposes.	
CO2	Develop strategies and skills to enhance their ability to read and comprehend.	
CO3	Apply vocabulary skills to improve their language skills.	
CO4	Build the writing skills with specific reference to technical writing.	
CO5	Demonstrate language proficiency through LSRW skills.	
Text Books		

1.	Board of Editors. Fluency in English A Course book for Engineering and Technology. Orient Blackswan, Hyderabad : 2016
2.	Sudharshana.N.P and Saveetha. C. English for Technical Communication. Cambridge University Press: New Delhi, 2016.

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	Reference Books
1.	Raman, Meenakshi and Sharma, Sangeetha "Technical Communication Principles and Practice" Oxford University Press: New Delhi, 2014.
2.	Kumar, Suresh. E. "Engineering English" Orient Blackswan: Hyderabad, 2015.
3.	Booth-L. Diana, Project Work, Oxford University Press, Oxford: 2014.
4.	Davis, Jason and Rhonda LIss. Effective Academic Writing (Level 3) Oxford University Press: Oxford, 2006.
5.	Communicative English for Engineers and Professionals- Nitin Bhatnagar & Mamta Bhatnagar.
6.	Skills for Success. Listening and Speaking. Level 4- Margret Brooks.
7.	Grammar F. Margot and Colin S. Ward Reading and Writing (Level 3) Oxford University Press : Oxford, 2011.

Exercises for Batch of 30 Students

- 1. Listening Comprehension
- 2. Self- introduction
- 3. Short presentation
- 4. Group Discussion



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RE / R Tooh	B23PHI101 - ENGINEERING PHYSICS	L	т	Р	С
D.E. / D. Iecii.	(Common to all Branches)	3	0	2	4

	Course Objectives		
1.	To gain knowledge on the basics of properties of matter, its applications and inculcate practical skills in the determination of elastic property of the materials.		
2.	To acquire knowledge & experimental skills on the concepts of Photonics and their applications in fiber optics.		
3.	To have adequate knowledge on the concepts of electrical, magnetic properties of materials and enhance the practical skills in determination of electrical properties of the materials.		
4.	To get knowledge on advanced physics concepts of quantum theory and its applications in SEM, TEM and induce practical skills in microscope.		
5.	To enhance the fundamental knowledge of students in Crystal Physics and its Applications relevant to various streams of Engineering and Technology.		

UNIT - I	I PROPERTIES OF MATTER			

Elasticity - Modulus, types of modulii of elasticity, Stress - strain diagram and its uses - factors affecting elastic modulus and Twisting couple, torsion pendulum; theory and experiment

Bending of beams - Bending moment - uniform and non- uniform bending; theory and experiment -I - shaped girders and its applications

Determination of rigidity modulus - Torsion pendulum - Determination of Young's modulus by non-uniform bending method - Determination of Young's modulus by uniform bending method

UNIT - II	PHOTONICS AND FIBER OPTICS	12			
Lasers ; pro	Lasers ; properties of laser-spontaneous and stimulated emission-amplification of light by population				
inversion - Einstein's A and B coefficients - derivation – Types of laser; Nd YAG Laser, Semiconductor					
lasers; homoj	lasers; homojunction and heterojunction, Industrial and Medical Applications				
Fiber Optics ; Principle, Numerical Aperture and Acceptance Angle - Types of optical fibres - Fiber optic					
communication System - Block diagram - Medical Applications - Endoscopy					
Determination of wavelength of the Laser using grating- Determination of particle size using					
Laser - Determination of Numerical aperture and acceptance angle of an optical fiber					

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د عنه ۲۰۰۰ KIT - Kalaignarkarunanidhi Institute of Techno					
UNIT - III	ELECTRICAL AND MAGNETIC PROPERTIES OF MATERIALS	12			
Classical fre – Thermal co Quantum the Introduction theory of ferro Determinatio	Classical free electron theory – Relaxation time and collision time - Expression for electrical conductivity – Thermal conductivity – Wiedemann - Franz law – Lorentz number - Drawbacks of classical theory - Quantum theory - Fermi - Dirac statistics – variation of Fermi level with temperature Introduction to magnetic materials – Comparision of Dia, Para and Ferro magnetic materials – Domain theory of ferromagnetism - Hysteresis - Soft and Hard magnetic materials - Ferrites and its applications. Determination of specific resistance of the wire using Carey Foster's Bridge				
UNIT - IV	QUANTUM PHYSICS	12			
 Black body radiation; Planck's theory (derivation) - wave particle duality- debroglie's wavelength -concept of wave function and its physical significance Wave equation; Schroedinger's time independent and time dependent equations, particle in a one-dimensional rigid box. Applications; Scanning Electron Microscope (SEM) and Transmission Electron Microscope (TEM) Determination of thickness of a thin wire by using travelling microscope 					
UNIT - V	CRYSTAL PHYSICS	10			
Crystal Structures; Single crystalline, polycrystalline and amorphous materials - unit cell - space lattice - crystal systems - Bravais lattices - Miller indices- inter - planar distances – coordination number and packing factor for SC, BCC, FCC and HCP structures Crystal imperfections; Point and Line defects - Burger vector					

Total Instructional hours : 60

	Course Outcomes : Students will be able to			
CO1	Categorize the basics of properties of matter and its applications, classify the elastic properties of materials by using uniform, non-uniform bending method and torsional pendulum apparatus.			
CO2	Explain the basics of Laser, Fiber Optics and their applications, determination of Particle size, Wavelength of laser and acceptance angle, numerical aperture of optical fiber.			
CO3	Justify the concepts of electrical, magnetic properties of materials, determination of Specific resistance of the material.			

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CO4 Interpret the basic knowledge of quantum theory that could be helpful in understanding the wave functions of the particle and determination of thickness of thin sheet by using travelling microscope.

CO5 Classify and compare the different types of Crystals, their structures and its defects.

Text Books			
1.	Bhattacharya, D.K. & Poonam, T, "Engineering Physics", Oxford University Press, 2015.		
2.	Gaur, R.K. & Gupta, S.L. "Engineering Physics", Dhanpat Rai Publishers, 2012.		
3.	Pandey, B.K. & Chaturvedi, S. "Engineering Physics", Cengage Learning India, 2012.		
4.	Rajendran V, "Engineering Physics", Tata McGraw Hill, Publishing Company, New Delhi, 2011.		
5.	Wahab, M.A Solid State Physics: Structure and Properties of Materials, Narosa Publishing House, 2009.		

	Reference Books		
1.	Halliday, D., Resnick, R. & Walker, J. "Principles of Physics"", Wiley, 2015.		
2.	Serway, R.A. & Jewett, J.W. "Physics for Scientists and Engineers", Cengage Learning, 2010.		
3.	Tipler, P.A. & Mosca, G. "Physics for Scientists and Engineers with Modern Physics",W.H. Freeman, 2007.		
4.	Avadhanulu M.N, "Engineering Physics - Volume 1", S.Chand & Company Ltd., New Delhi, 2010.		
5.	Garcia, N. & Damask, A Physics for Computer Science Students. Springer - Verlag, 2012.		
6.	Senthil Kumar, G. Physics Laboratory I & II, VRB publishers Pvt. Ltd., Chennai (2016).		

Equipment Needed for 30 Students

1.	Diode Laser (2 mS power) , He – Ne Laser source (2mW), Optical Fibre Kit	-	06
2.	Travelling Microscope ,Knife edge, Slotted weights	-	19
3.	Carey Foster Bridge	-	06
4.	Air Wedge Apparatus with Travelling Microscope	-	06
5.	Torsional Pendulum	-	06



	B23EEI202 - BASIC ELECTRICAL AND	L	т	Р	С
B.E.	ELECTRONICS ENGINEERING				
	(Common to AERO, AGRI and MECH)	3	0	2	4

Course Objectives		
1.	To analyse the electric circuit laws and theorems.	
2.	To analyse the single and three phase circuits with different types of load.	
3.	To understand the working principles and characteristics of electrical machines.	
4.	To understand the working principle of various electronic devices.	
5.	To understand the concept of electrical wiring and safety.	

ELECTRICAL CIRCUITS

Basic circuit components - Ohms Law - Kirchoff's Law – Instantaneous Power – Inductors - Capacitors – Independent and Dependent Sources. Steady state solution of DC circuits - Nodal analysis, Mesh analysis. Network Theorems -Thevenin's theorem, Norton's theorem, Maximum Power transfer theorem - Superposition theorem

UNIT - II

UNIT - I

AC CIRCUITS

Introduction to AC circuits – waveforms and RMS value – power and power factor, single phase and three - phase balanced circuits – Three phase loads

UNIT - III

ELECTRICAL MACHINES

Construction, working and characteristics of DC machines, single phase transformers, single phase and three phase induction motors, Introduction to special electrical machines (BLDC, PMSM)

UNIT - IV

ELECTRONIC DEVICES AND CIRCUITS

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Types of Materials – Silicon and Germanium- N type and P type materials – PN Junction - Forward and Reverse Bias – Semiconductor Diodes. Bipolar Junction Transistor - Characteristics – Field Effect Transistors – Transistor Biasing. Introduction to operational Amplifier – Inverting Amplifier – Non Inverting Amplifier

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UNIT - V

ELECTRICAL WIRING AND SAFETY

Housing wiring, industrial wiring, materials of wiring – Hazards of electricity - Electrical safety equipment – safety procedures and methods – Grounding – safety requirements and standards - Human factors in electrical safety

Total Instructional hours : 45

Expt. No.	Description of the Experiments
1.	Verification of Circuit Laws.
2.	Verification of Circuit Theorems.
3.	Measurement of three phase power.
4.	Load test on DC shunt motor.
5.	Speed control of DC shunt motor.
6.	Load test on Single phase Transformer.
7.	Load test on single phase Induction motor.
8.	VI characteristics of Diode.
9.	Characteristics of Common Emitter Configuration in NPN transistor.
	Total Practical hours : 30
	Total Instructional hours : 45 + 30 = 75

Course Outcomes : Students will be able to		
CO1	Apply basic circuit laws and Theorems to analyze the electrical circuits.	
CO2	Analyze the single and three phase circuit with different types of load.	
CO3	Examine the performance of DC machines, transformers, induction motors and explain the construction and operation of special machines.	
CO4	Analyze the characteristics of various semiconductor devices.	
CO5	Outline the basic wiring materials, types of wiring and Safety practices	

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	Text Books
1.	Leonard S Bobrow, Foundations of Electrical Engineering, Oxford University Press, 2013.
2.	Kothari.D.P and Nagarath.I.J,Electrical Machines - Basic Electrical and Electronics Engineering, McGraw Hill Education (India) Private Limited, Third Reprint, 2016.
3.	S.Salivahanan, N.Suresh Kumar, Electronic Devices and Circuits, McGraw Hill Education (India) Private Limited, 4 th edition, 2017.
4.	E.G. Janardanan, "Special electrical machines", PHI learning Private Limited, Delhi, 2014.
5.	John Cadick, P.E, "Electrical Safety Handbook", 4 th edition, McGraw Hill, 2012.

	Reference Books
1.	N K De, DipuSarkar, Basic Electrical Engineering, Universities Press (India) Pvt. Ltd, 2016.
2.	Vincent Del Toro, Electrical Engineering Fundamentals, Pearson Education, Second Edition New Delhi, 2015.
3.	John Bird, Electrical Circuit Theory and Technology, Elsevier, Fifth Edition, 2014.





DE	B23AET301 - FUNDAMENTALS OF AEROSPACE	L	Т	Ρ	С
D.C.	ENGINEERING	3	0	0	3

Course Objectives		
1.	To understand the Historical evaluation of Airplanes.	
2.	To study the different component systems and functions.	
3.	To understand the basic properties and principles behind the flight.	
4.	To study the various types of power plants used in aircrafts.	
5.	To study the different structures & construction.	

UNIT - I HISTORY OF FLIGHT 9

Balloon flight – ornithopters - Early Airplanes by Wright Brothers, biplanes and monoplanes, Developments in aerodynamics, materials, structures and propulsion over the years.

UNIT - II	AIRCRAFT CONFIGURATIONS AND ITS CONTROLS
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Different types of flight vehicles, classifications - Components of an airplane and their functions -Conventional control, powered control - Basic instruments for flying - Typical systems for control actuation.

UNIT - III	BASICS OF AERODYNAMICS

Physical Properties and structures of the Atmosphere - Temperature, pressure and altitude relationships - Newton's Law of Motions applied to Aeronautics - Evolution of lift, drag and moment - Aerofoils, Mach number, Maneuvers.

UNIT - IV

BASICS OF PROPULSION

Basic ideas about piston, turboprop and jet engines – use of propeller and jets for thrust production -Comparative merits, Principle of operation of rocket - types of rocket and typical applications -Exploration into space.

HORENV Programme Coordinator

J.M.L **BoS Chairman**

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UNIT - V

BASICS OF AIRCRAFT STRUCTURES

General types of construction - Monocoque, semi-monocoque and geodesic constructions, typical wing and fuselage structure - Metallic and non-metallic materials - Use of Aluminum alloy, titanium, stainless steel and composite materials - Stresses and strains - Hooke's law - stress-strain diagrams - elastic constants - Factor of Safety.

Total Instructional hours : 45

Course Outcomes		
	At the end of the course, the students will be able to	
CO1	Outline the history of Aircraft and developments over the years.	
CO2	Identify the types and classification of components and control system.	
CO3	Apply the various forces and properties in Aircraft.	
CO4	Categorize the different types of engines and principles of rocket.	
CO5	Identify different type of fuselage and constructions.	
Text Books		
1.	Anderson, J.D., Introduction to Flight, McGraw-Hill; 8 th edition, 2015	

0	Dishard C. Chavall, "Eurodemontals of Flight" Decrean Education and Edition 2004
Ζ.	Richard S. Shevell, Fundamentals of Flight, Pearson Education,2nd Edition – 2004.

	Reference Books
1.	Kermode, A.C. Flight without Formulae, Pearson Education; Eleven edition, 2011.
2.	Stephen. A. Brandt, Introduction to aeronautics: A design perspective, 2 nd edition, AIAA Education Series, 2004.
3.	Lalit Gupta and O P Sharma, "Fundamentals of Flight Vol-I to Vol-IV", Himalayan Books, 2006.

Hedrew **Programme Coordinator**

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BoS Chairman	

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B.E.	В

23AET302 – SOLID MECHANICS

L	т	Ρ	С
3	0	0	3

Course Objectives		
1.	To understand the concepts of stress, strain, principal stresses and principal planes.	
2.	To study the concept of shearing force and bending moment due to external loads in determinate beams and their effect on stresses.	
3.	To determine stresses and deformation in circular shafts and helical spring due to torsion.	
4.	To compute slopes and deflections in determinate beams by various methods.	
5.	To study the stresses and deformations induced in thin and thick shells.	

UNIT - I STRESS, STRAIN AND DEFORMATION OF SOLIDS

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Rigid bodies and deformable solids – Tension, Compression and Shear Stresses – Deformation of simple and compound bars – Thermal stresses – Elastic constants – Volumetric strains – Stresses on inclined planes – principal stresses and principal planes – Mohr's circle of stress.

UNIT - II TRANSVERSE LOADING ON BEAMS AND STRESSES IN BEAM

Beams – types transverse loading on beams – Shear force and bending moment in beams - Cantilevers – Simply supported beams and over – hanging beams. Theory of simple bending – bending stress distribution – Load carrying capacity – Proportioning of sections – Shear stress distribution.

UNIT - III

TORSION

Torsion formulation stresses and deformation in circular and hollows shafts – Stepped shafts – Deflection in shafts fixed at the both ends – Stresses in helical springs – Deflection of helical springs, carriage springs.

UNIT - IV

DEFLECTION OF BEAMS

Double Integration method – Macaulay's method – Area moment method for computation of slopes and deflections in beams - Conjugate beam and strain energy – Maxwell's reciprocal theorems.

Hedrew Programme Coordinator

J. M. J. **BoS Chairman**

UNIT - V

THIN CYLINDERS, SPHERES AND THICK CYLINDERS

9

Stresses in thin cylindrical shell due to internal pressure circumferential and longitudinal stresses and deformation in thin and thick cylinders – spherical shells subjected to internal pressure – Deformation in spherical shells – Lame's theorem.

	Course Outcomes : Students will be able to
CO1	Explain the concept of stress and strain in simple compound bars.
CO2	Illustrate the load transferring mechanism in beams and shear distribution due to shearing force and bending moment.
CO3	Apply basic equation of simple torsion in designing of shafts, helical spring and columns.
CO4	Identify the slope and deflection in beams using different methods.
CO5	Solve the thin and thick shells for the applied internal and external pressures.

	Text Books	
1.	Egor. P.Popov "Engineering Mechanics of Solids" Prentice Hall of India, New Delhi, 2002	
2.	Jindal U.C., "Strength of Materials", Asian Books Pvt. Ltd., New Delhi, 2007	
Reference Books		

	Reference Books
1.	Bansal, R.K., "Strength of Materials", Laxmi Publications (P) Ltd., 2007
2.	Ferdinand P. Been, Russell Johnson, J.r. and John J. Dewole "Mechanics of Tata McGraw Hill Publishing 'co. Ltd., New Delhi, 2005.
3.	Hibbeler, R.C., "Mechanics of Materials", Pearson Education, Low Price Edition, 2013

Hodien Programme Coordinator

J.Mong
BoS Chairman

KIT - CBE (An Autonomous Institution)

R E	B23AET303 – ENGINEERING FLUID	L	т	Р	С
D.E.	MECHANICS	3	0	0	3

Course Objectives	
1.	To study the properties of fluids and concept of control volume.
2.	To study applications of the conservation laws to flow through pipes.
3.	To understand the importance of dimensional analysis
4.	To study the importance of various types of flow in pumps.
5.	To understand the importance of various types of flow in turbines.

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FLUID PROPERTIES AND FLOW CHARACTERISTICS

Units and dimensions - Properties of fluids - mass density, specific weight, specific volume, specific gravity, viscosity, compressibility, vapor pressure, capillarity and surface tension. Flow characteristics – concept of control volume - application of control volume to continuity equation.

UNIT - II

FLOW THROUGH CIRCULAR CONDUITS

Hydraulic and energy gradient - Laminar flow through circular conduits and circular annuli - Boundary layer concepts – types of boundary layer thickness – Darcy Weisbach equation – friction factor - commercial pipes - minor losses – Flow through pipes in series and parallel.

UNIT - III

DIMENSIONAL ANALYSIS

Need for dimensional analysis – methods of dimensional analysis – Similitude – types of similitude – Dimensionless parameters - application of dimensionless parameters – Model analysis.

UNIT - IV

PUMPS

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Euler's equation - Theory of Roto-dynamic machines – various efficiencies – velocity components at entry and exit of the rotor - velocity triangles - Centrifugal pumps – working principle - work done by the impeller - performance curves - Reciprocating pump - working principle.

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UNIT - V

TURBINES

Classification of turbines – heads and efficiencies – velocity triangles. Axial, radial and mixed flow turbines. Pelton wheel, Francis turbine and Kaplan turbines - working principles - work done by water on the runner – draft tube - performance curves for turbines – governing of turbines.

	Course Outcomes : Students will be able to
CO1	Relate the mathematical knowledge to predict the properties and characteristics of fluid.
CO2	Identify the major and minor losses associated with pipe flow in piping networks.
CO3	Make use of mathematical prediction to select the nature of physical quantity.
CO4	Analyze critical performance of pumps.
CO5	Analyze critical performance of turbines.

	Text Books
1.	White, Frank M. Fluid Mechanics. 7th ed. McGraw-Hill, 2010. ISBN: 9780077422417
2.	S K Som, G Biswas, Suman Chakraborty, Introduction to Fluid Mechanics and Fluid machines, Tata McGraw Hill Edition, 2017.

	Reference Books
1.	Graebel. W.P, "Engineering Fluid Mechanics", Taylor & Francis, Indian Reprint, 2011.
2.	Kumar K.L., "Engineering Fluid Mechanics", Eurasia Publishing House (p) Ltd., New Delhi, 2016.
3.	Robert W.Fox, Alan T. McDonald, Philip J.Pritchard, "Fluid Mechanics and Machinery", 2011.

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B.E.	B23AEI301 - AERO ENGINEERING THERMODYNAMICS	L 3	Т 0	P 2	C 4
Course Objectives					
1. To make the students understand the basic concepts of thermodynamics and the application of first law of thermodynamics to open and closed systems.					

2.	To understand the concept of second law of thermodynamics and entropy
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- 3. To develop the relations of efficiency and mean effective pressure for various air standard cycles.
- 4. To calculate the power developed from steam as the working medium.
- 5. To understand the basics of jet engines and heat transfer methods.

FUNDAMENTAL CONCEPT AND FIRST LAW

Concept of continuum, microscopic and macroscopic approach, thermodynamic systems – closed, open and isolated. Thermodynamic Properties, state, path and process, quasi-static process, internal energy, enthalpy, specific heat capacities, work and heat transfer. Zeroth law of thermodynamics, First law of thermodynamics,SFEE, application of SFEE to jet engine components-Numerical problems.

UNIT - II

UNIT - I

SECOND LAW AND ENTROPY

Second law of thermodynamics – Kelvin Planck and Clausius statements of second law, Reversibility and Irreversibility, Carnot theorem, Carnot cycle, Reversed Carnot cycle, efficiency, COP, Thermodynamic temperature scale - Clausius inequality, Concept of entropy, Entropy change for various processes, Mixing of fluids-Numerical problems.

UNIT - III

AIR STANDARD CYCLES

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Otto, Diesel, Dual, Ericsson, Atkinson, Stirling and Brayton cycles - air standard efficiency - mean effective pressure-Numerical problems.

UNIT - IV

FUNDAMENTALS OF VAPOUR POWER CYCLES

12

Properties of pure substances – solid, liquid and vapour phases, phase rule, p-v, p-T, T-v, T-s, h-s diagrams, p-v-T surfaces, thermodynamic properties of steam - calculations of work done and heat transfer in non-flow and flow processes - standard Rankine cycle, Reheat and Regeneration cycle. Heatrate, Specific steam consumption, Tonne of refrigeration-Numerical problems.

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UNIT - V

BASICS OF PROPULSION AND HEAT TRANSFER

Classification of jet engines -working principles- thrust equation, specific thrust, SFC, TSFC, specific impulse - isentropic efficiencies of jet engine components, actual cycles. Heat transfer modes-conduction in parallel, radial, and composite wall- convective and radiation- numerical problems.

Total Instructional hours : 60

Course Outcomes : Students will be able to			
CO1	Apply first law of thermodynamics to solve problems related to open and closed systems		
CO2	Estimate the heat engine efficiency and COP for both heat pump and refrigeration systems.		
CO3	Identify efficient air cycles for specific applications.		
CO4	calculate the power developed from steam as the working medium		
CO5	Analyze the various jet engines parameters and modes of heat transfer.		

List of Experiments			
Expt. No.	Description of the Experiments		
1.	Performance test on a 4-stroke engine		
2.	Valve timing of a 4 – stroke engine		
3.	Port timing of a 2 stroke engine		
4.	Determination of thermal resistance of a composite wall.		
5.	COP test on a vapour compression refrigeration test rig		
6.	COP test on a vapour compression air-conditioning test rig		
7.	Determination of specific heat of solid		
8.	Determination of thermal conductivity of solid.		
9.	Determination of effectiveness of a parallel flow heat exchanger		
10.	Determination of effectiveness of a counter flow heat exchanger		
Total Instructional hours : 60			

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Text Books				
1.	Nag.P.K., "Engineering Thermodynamics", Tata McGraw-Hill, New Delhi, 2013.			
2.	Yunus A. Cengel and Michael A. Boles, "Thermodynamics: An Engineering Approach" McGraw- Hill Science / Engineering / Math; 7 th edition 2010.			
Reference Books				
1.	Rathakrishnan E., "Fundamentals of Engineering Thermodynamics", Prentice-Hall India, 2005.			
2.	Holman J.P., "Thermodynamics", 3 rd Edition, McGraw-Hill, 2007.			
3.	Rayner Joel, "Basic Engineering Thermodynamics", 5th Edition, Addison Wesley, New York, 2016			



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B.E.		B23AEP301 – SOLID MECHANICS LABORATORY	т	Ρ	ΤU	С
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Course	e Ob	ectives				
1.	To s	tudy the stress -strain curve and understand its behaviour.				
2.	To s	tudy the linearly elastic behaviour of mild steel under different loading conditions.				
3.	То е	valuate the fracture behaviour of materials when subjected to im	pact loa	iding.		
4.	To s	tudy the mechanical properties of materials when subjected to di	fferent	types o	floading] .
5.	То е	xamine the mechanical properties of materials under compressio	n.			
		List of Experiments				
Expt.	No.	Description of Equipment				
1.		Tension test on a mild steel rod				
2.		Double shear test on Mild steel and Aluminum rods				
3.		Torsion test on mild steel rod				
4.		Deflection test on beams				
5.		Charpy Impact test on metal specimen				
6.		Izod Impact test on metal specimen				
7.		Hardness test on metals using Brinnell Hardness Number				
8.		Hardness test on metals using Rockwell Hardness Number				
9.		Compression test on helical springs				
10	-	Strain Measurement using Rosette strain gauge				

Total Instructional hours : 30

Course Outcomes : Students will be able CO1 Identify the mechanical properties like tensile and compressive strength, shear strength of materials.

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CO2	Analyze the deformation behavior of materials for different loading conditions.
CO3	Identify the materials for best practices based on mechanical properties like toughness.
CO4	Analyze the different hardened samples using various hardness machines.
CO5	Utilize the strain gauges for measurement of loaded beams.

List of Equipment for Batch of 30 Students

SI. No.	Name of the Equipment	
1.	Universal Tensile Testing machine with double 1 shear attachment – 40 Ton Capacity	1
2.	Torsion Testing Machine (60 NM Capacity)	1
3.	Impact Testing Machine (300 J Capacity)	1
4.	Brinell Hardness Testing Machine	1
5.	Rockwell Hardness Testing Machine	1
6.	Spring Testing Machine for tensile and compressive loads (2500 N)	1
7.	Strain Indicator	1

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List of Experiments			
Expt. No.	Description of the Experiments		
1.	Determination of the Coefficient of discharge of given Orifice meter.		
2.	Determination of the Coefficient of discharge of given Venturi meter.		
3.	Calculation of the rate of flow using Rota meter.		
4.	Determination of friction factor for a given set of pipes.		
5.	Conducting experiments and drawing the characteristic curves of centrifugal pump.		
6.	Conducting experiments and drawing the characteristic curves of reciprocating pump.		
7.	Conducting experiments and drawing the characteristic curves of Gear pump.		
8.	Conducting experiments and drawing the characteristic curves of Pelton wheel.		
9.	Conducting experiments and drawing the characteristics curves of Francis turbine.		
10.	Conducting experiments and drawing the characteristic curves of Kaplan turbine.		
Total Instructional hours : 30			

- 5. To verify the performance of the turbines.
- Course Objectives

 1.
 To study the coefficient of discharge for various flow meters.

 2.
 To calculate rate of flow for the liquids.

 3.
 To determine friction factor for a pipes.

 4.
 To verify the performance of the pumps.
- B.E. B23AEP302 ENGINEERING FLUID MECHANICS T P TU C LABORATORY 0 4 0 2

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Course Outcomes : Students will be able				
CO1	Analyze the various flow meters for measuring coefficient of discharge.			
CO2	Examine the operation of the variation in friction factor for the given set of pipes.			
CO3	Analyze the discharge coefficients of flow meters for calibration of centrifugal and reciprocating pumps.			
CO4	Examine the performance of Pelton wheel and gear pump.			
CO5	Evaluate the characteristics curves of the operation of fluid machineries.			

List of Equipment for a Batch of 30 Students				
SI. No.	Name of the Equipment	Quantity		
1.	Orifice meter setup	1		
2.	Venturi meter setup	1		
3.	Rotameter setup	1		
4.	Pipe Flow analysis setup	1		
5.	Centrifugal pump	1		
6.	Reciprocating pump setup	1		
7.	Gear pump setup	1		
8.	Pelton wheel setup	1		
9.	Francis turbine setup	1		
10.	Kaplan turbine setup	1		

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D.C.	MECHANICS	3	0	0	3

Course Objectives

1.	To provide the students an understanding on the linear static analysis of determinate and indeterminate aircraft structural components.
2.	To calculate the deflection of beams, frames and trusses by different energy methods.
3.	To calculate the buckling load and stresses in beam columns.
4.	To provide the design process using different failure theories.
5.	To understand the impacts of induced stresses.

UNIT - I STATICALLY DETERMINATE & INDETERMINATE STRUCTURES

Plane truss analysis – Method of joints – Method of sections – Method of shear – 3-D Trusses – principle of super position, Clapeyron's 3 Moment equation.

UNIT - II

ENERGY METHODS

Strain Energy in axial, bending, Torsion and shear loadings. Castigliano's theorems and their applications. Energy theorems – Dummy load & unit load methods – Energy methods applied to Statically determinate and Indeterminate beams, Frames, Rings & Trusses.

UNIT - III

COLUMNS

Euler's column curve – Inelastic buckling – Effect of initial curvature – South well plot – Columns with eccentricity – use of energy methods – theory of beam columns – beam columns with different end conditions – Stresses in beam columns.

UNIT - IV

FAILURE THEORIES

Ductile and Brittle materials – Maximum principal stress theory - Maximum principal strain theory - Maximum shear stress theory - Distortion energy theory – Octahedral shear stress theory.

UNIT - V

INDUCED STRESSES

Thermal stresses – Impact loading – Fatigue – Creep - Stress Relaxation, Introduction to elasticity approach.

Total Instructional hours : 45

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	Course Outcomes : Students will be able to		
CO1	Identify the determinate and indeterminate aircraft structural components based on linear static analysis.		
CO2	Apply the reactions of structures using strain energy concept.		
CO3	Identify the stresses in beam columns with different end conditions.		
CO4	Examine the structural failures using different theories of failures.		
CO5	Identify response of statically indeterminate structures under various loading conditions.		

	Text Books
1.	James M. Gere & Barry J Goodno.,"Mechanics of Materials", cengage Learning Custom Publishing; 8th edition, 2012.
2.	Megson T M G.," Aircraft Structures for Engineering students", Butterworth-Heinemann publisher, 5th edition, 2012.

	Reference Books
1.	Bruhn E F., "Analysis and Design of Flight Vehicle Structures", Tri-State Off-set Company, USA, 1985.
2.	Donaldson, B.K., "Analysis of Aircraft Structures", - An Introduction' Cambridge University Press publishers, 2 nd edition, 2008.
3.	Peery, D.J., and Azar, J.J.," Aircraft Structures", 2 nd edition, McGraw – Hill, N.Y., 1999.

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DE		т	Р	ΤU	С
D.C.	B23AE1402 - AIR BREATHING PROPULSION	3	0	0	3

	Course Objectives
1.	To establish fundamental approach and application of jet engine components and estimate the thrust developed by jet engine.
2.	To understand the working principle of inlets & its types, nozzle & its types.
3.	To gain knowledge about the different types of combustion chambers and its mechanism.
4.	To understand the working principle of axial compressor and centrifugal compressor.
5.	To gain knowledge about the working of turbines and its matching with other components.

UNIT - I

PRINCIPLES OF AIR BREATHING ENGINES

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Operating principles of piston engines – Classification of piston engines - Illustration of working of gas turbine engines – Factors affecting thrust – Methods of thrust augmentation – Performance parameters of jet engines – Study on recent advancement in air breathing engine.

UNIT - II	JET ENGINE INTAKES AND EXHAUST NOZZLES

Ram effect, Internal flow and Stall in subsonic inlets - Modes of operation - Supersonic inlets – Starting problem on supersonic inlets – Shock swallowing by area variation – Real flow through nozzles and nozzle efficiency – losses in nozzles – Ejector and variable area nozzles - Interaction of nozzle flow with adjacent surfaces – Thrust reversal.

UNIT - III

JET ENGINE COMBUSTION CHAMBERS

Chemistry of combustion, Combustion equations, Combustion process, Classification of combustion chambers – Combustion chamber performance – Effect of operating variables on performance – Flame stabilization.

UNIT - IV

JET ENGINE COMPRESSORS

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Euler's turbo machinery equation, Principle operation of centrifugal compressor, Principle operation of axial flow compressor– Work done and pressure rise – velocity diagrams – degree of reaction – Free vortex and constant reaction designs of axial flow compressor – Performance parameters axial flow compressors– Stage efficiency.

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UNIT - V

JET ENGINE TURBINES

Principle of operation of axial flow turbines – limitations of radial flow turbines - Work done and pressure rise – Velocity diagrams – Degree of reaction – Constant nozzle angle designs – Performance parameters of axial flow turbine– Turbine blade cooling methods – Stage efficiency calculations – Basic blade profile design considerations – Matching of compressor and turbine.

Total Instructional hours : 45

	Course Outcomes : Students will be able to
CO1	Interpret control volume and momentum equation to estimate the forces produced by aircraft propulsion systems.
CO2	Illustrate the principal design parameters and constraints that set the performance of gas turbine engines.
CO3	Analyze the gas turbine engine to relate thrust and fuel burn to component performance parameter.
CO4	Identify the working of multistage compressor to use velocity triangles for the performance of compressor.
CO5	Make use of velocity triangles and turbine blade cooling methods to choose the turbine performance parameters.

	Text Books
1.	Hill, P.G. & Peterson, C.R. "Mechanics & Thermodynamics of Propulsion" Pearson education (2009)
2.	Cohen, H. Rogers, G.F.C. and Saravanamuttoo, H.I.H. "Gas Turbine Theory", Pearson Education Canada; 6 th edition, 2008.

	Reference Books
1.	Mathur, M.L. and Sharma, R.P., "Gas Turbine, Jet and Rocket Propulsion", Standard Publishers & Distributors, Delhi, 2 nd edition 2014.
2.	Oates, G.C., "Aero thermodynamics of Aircraft Engine Components", AIAA Education Series, New York, 1985.
3.	"Rolls Royce Jet Engine", Rolls Royce; 4 th revised edition, 1986.

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DE	B23AET403 – AIRCRAFT SYSTEMS AND	Т	Ρ	TU	С
D.C.	INSTRUMENTS	3	0	0	3

Course Objectives		
1.	To impart knowledge of the hydraulic and pneumatic systems components.	
2.	To impart the modern control system and auto pilot system in aircraft	
3.	To understand the different types of fuel system in jet engine and piston engine.	
4.	To Apply the air cycle system, vapors cycle system and cabin pressurization system.	
5.	To get the knowledge about the accelerometer, air speed indicator and gyroscopic	

UNIT - I	AIRCRAFT SYSTEMS	9
Hydraulic sys	tems – Study of typical systems – Components – Hydraulic systems controllers – M	odes of

operation – Pneumatic systems – Working principles – Typical Pneumatic Power system – Brake system – Components, Landing Gear Systems – Classification – Shock absorbers – Retractive mechanism.

UNIT - II

AIRPLANE CONTROL SYSTEMS

Conventional Systems – Power assisted and fully powered flight controls – Power actuated systems – Engine control systems – Push pull rod system – Operating principles – Modern control systems – Digital fly by wire systems – Auto pilot system, Active Control Technology.

UNIT - III

ENGINE SYSTEMS

Piston and Jet Engines- Fuel systems – Components - Multi-engine fuel systems, lubricating systems – Starting and Ignition systems.

UNIT - IV

AIRCONDITIONING AND PRESSURIZING SYSTEM

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Basic Air Cycle systems – Vapour Cycle Systems, Boot-strap air cycle system – Evaporative vapour cycle systems – Evaporation air cycle systems – Oxygen systems – Fire extinguishing system and Smoke detection system, Deicing and anti-icing system.

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UNIT - V

AIRCRAFT INSTRUMENTS

Flight Instruments and Navigation Instruments – Accelerometers, Air speed Indicators – Mach Meters – Altimeters – Gyroscopic Instruments– Principles and operation – Study of various types of engine instruments – Tachometers – Temperature and Pressure gauges.

Total Instructional hours : 45

	Course Outcomes : Students will be able to		
CO1	Explain the principles and working of different Aircraft systems.		
CO2	Compare the features of various flight control system.		
CO3	Identify the performance of various aircraft engine systems.		
CO4	Experiment with the data from various aircraft system cycle.		
CO5	Identify the principles and operation of various cockpit control systems.		

	Text Books
1.	Mekinley, J.L. and R.D. Bent, "Aircraft Power Plants", McGraw Hill 1993.
2.	Pallet, E.H.J, "Aircraft Instruments & Principles, " Pitman & Co 1993.

	Reference Books
1.	Handbooks of "Airframe and Power plant Mechanics", US dept. of Transportation, Federal, Aviation Administration, the English Book Store, New Delhi, 1995.
2.	McKinley, J.L. and Bent R.D., "Aircraft Maintenance & Repair", McGraw Hill, 1993.
3.	Teager, S, "Aircraft Gas Turbine technology", McGraw Hill 1997.

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DE		ТР	Р	TU	С
D.C.	BZ3AEI401 - LOW SPEED AEROD I NAMICS	3	0	2	4

	Course Objectives
1.	To introduce the concepts of mass, momentum and energy conservation relating to aerodynamics.
2.	To make the student understand the concept of vorticity, irrotationality and real flow over the 2D objects.
3.	To understand the Theory of Aero foil And Wing Sections
4.	To introduce the basics of viscous flow.
5.	To introduce the conceptual boundary layer thickness.

INTRODUCTION TO LOW-SPEED FLOW UNIT - I

Euler equation, Incompressible Bernoulli's Equation. Circulation and Vorticity, Green's lemma and Stoke's Theorem, Barotropic flow, Kelvin's Theorem, Streamline, Stream function, Irrotational flow, Potential function, Equipotential lines, Elementary flows and their combinations.

UNIT - II TWO-DIMENSIONAL INVISCID INCOMPRESSIBLE FLOW

Ideal Flow over a circular cylinder, D'Alembert's Paradox, Magnus Effect, Kutta Joukowski's Theorem, Starting vortex, Kutta condition, Real flow over smooth and rough cylinder.

UNIT - III **AIRFOIL THEORY**

Cauchy - Riemann relations, complex potential, Methodology of conformal Transformation, kutta -Joukowski's Transformation and its applications, Thin Airfoil Theory and its Applications.

UNIT - IV

SUBSONIC WING THEORY

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Vortex filament, Biot and Savart law, bound vortex and Trailing vortex, horse shoe vortex, Lifting line Theory and its Limitations.

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UNIT - V

INTRODUCTION TO BOUNDARY LAYER THEORY

Boundary layer and Boundary layer Thickness, Displacement Thickness, Momentum Thickness, Energy Thickness, Shape Parameter, Boundary layer equations for a steady, two-dimensional incompressible flow, boundary layer growth over a flat plate, critical Reynolds number, Blasius solution, basics of turbulent flow.

Total Instructional hours : 45

	Course Outcomes : Students will be able to		
CO1	Identify the characteristics of low-speed flow.		
CO2	Examine the characteristics of wing performance in in viscid compressible flow.		
CO3	Apply the airfoil theory to predict airfoil performance.		
CO4	Interpret the concept of subsonic wing theory and vortex formations.		
CO5	Categorize the characteristics of boundary layer formation.		

Text Books		
1.	Anderson, J.D., "Fundamentals of Aerodynamics", McGraw Hill Book Co., 2010.	
2.	Clancy, L J.," Aerodynamics", Pitman, 1986.	

Reference Books		
1.	John J Bertin., "Aerodynamics for Engineers", Pearson Education Inc, 2002.	
2.	Kuethe, A.M and Chow, C.Y, "Foundations of Aerodynamics", Fifth Edition, John Wiley & Sons, 2000.	
3.	Milne Thomson, L.H., "Theoretical Aerodynamics", Macmillan, 1985.	

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List of Experiments		
Expt. No.	Description of the Experiments	
1.	Calibration of a subsonic Wind tunnel.	
2.	Determination of lift for the given airfoil section.	
3.	Pressure distribution over a smooth circular cylinder.	
4.	Pressure distribution over a rough circular cylinder.	
5.	Pressure distribution over a symmetric aero foil.	
6.	Pressure distribution over a cambered aero foil.	
7.	Force measurement using wind tunnel balancing set up.	
8.	Flow over a flat plate at different angles of incidence.	
9.	Flow visualization studies in low speed flows over cylinders.	
10.	Flow visualization studies in low speed flows over airfoil with different angle of incidence.	
	Total Instructional hours : 30	

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List of Equipment				
SI. No.	No. Name of the Equipment		Experiment No.	
1.	Subsonic Wind tunnel	1	1, 2, 4, 5, 6, 7, 8, 9, 10	
2.	Models (aerofoil, rough and smooth cylinder, flat plate)	2	5, 6, 7, 8, 9, 10	
3.	Angle of incidence changing mechanism TORE	1 No.	8,10	
4.	Multi tube Manometer	1-No.	2, 3, 4, 5, 6	
5.	Pitot-Static Tubes	1 No.	1	
6.	Cylinder models (Rough and Smooth)	2 Nos.	3, 4	
7.	Wind Tunnel balances (3 or 6 components)	1 No.	7	
8.	Smoke Generator	1 No.	8, 9, 10	
9.	Water flow channel	1 No.	8, 9, 10	

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B.E.		B23AEP401 – AIRCRAFT COMPONENT	т	Ρ	TU	С
		DRAWING LABORATORY	0	4	0	2
		Course Objectives				
1.	To m	nake the students understand and interpret drawings of machir	e compo	onents		
2.	Тор	repare assembly drawings both manually and using standard (CAD pac	kages		
3.	To fa	miliarize the students with Indian Standards on drawing practice	es and st	andard	compo	nents
4.	To g	ain practical experience in handling 2D drafting and 3D modeli	ng softw	are sys	tems.	
5.	To u	nderstand the load impacts for various mechanical component	\$			
		List of Experiments				
Expt.	No.	Description of the Experiments				
1.	1. Drawing standards fits & tolerances, study of codes of practice for engineering drawing					
2.		Introduction to modelling software Solidworks				
3.	3. 3D Assembly of Flange Coupling COIMBATORE					
4.	4. 3D Assembly of Universal Coupling					
5.	5. 3D Assembly of Oldham's Coupling					
6.	6. 3D Assembly of Knuckle Joints					
7.		3D Assembly of Gib and cotter joints				
8.	8. 3D Assembly of sleeve and cotter joints					

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9.	Design and drafting control components bell crank
10.	3D Modelling of Swept Wing from Airfoil Coordinates
11.	3D Modelling of Aircraft fuselage
	Total Instructional hours : 60

Course Outcomes : Students will be able to	
CO1	Identify the drawing standard used in design.
CO2	Plan the fits and tolerances limits used in design.
CO3	Design the part drawings as per standard.
CO4	Design the sectional view of drawings as per standard.
CO5	Design the assembly drawings as per standard.

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