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ABBREVIATIONS/DEFINITIONS

- "AC" means, Academic Council of the University.
- "BOM" means, the Board of Management of the University.
- "BOS" means, the Board of Studies of the Department.
- "CAU/AUC-option" means change from Credit to Audit option / change from Audit to Credit option.
- "Class/Course Committee" means, the Class/Course Committee of a class/course.
- "Course" means, a specific subject usually identified by its course-number and course-title, with a specified syllabus / course-description, a set of references, taught by some teacher(s) / course-instructor(s) to a specific class (group of students) during a specific academic-semester / semester.
- "Course Instructor" means, the teacher or the Course Instructor of a Course.
- "Curriculum" means the set of Course-Structure and Course-Contents.
- "DAA" means, the Dean of Academic Affairs.
- "DAAB" means Departmental Academic Appeals Board.
- "DEC/PEC" means Dissertation Evaluation Committee / Project Evaluation committee.
- "Department" means a group in the University devoted to a specific discipline also called a School. Department and School are used interchangeably.
- "DSA" means, Dean Student Affairs.
- "ESE" means End-Semester Examination.
- "EYE" means End-Year Examination.
- "Faculty Advisor/Class Counsellor" means, the Faculty Advisor or the Panel of Faculty Advisors, in a Parent Department, for a group (admission-batch) of students. Also known as Class Counsellor.
- "Grade Card" means the detailed performance record in a semester/programme.
- "He" means both genders “he” and “she”; similarly "his" and/or "him" includes "her" as well, in all the cases.
- "HOD" means, the Head of the Department.
- "MES" means, Make-up End Semester.
- "MLC" means Mandatory Learning Course.
- "MSE" means Mid Semester Examination.
- "MYE" means Mid Year Examination.
- "Parent Department" or "Degree Awarding Department" means, the department that offers the degree programme that a student undergoes.
- "Project Guide" means, the faculty who guides the Major Project of the student.
- "Regulations" means, set of Academic Regulations.
- "University" or “LU” means, Lingaya’s University, Faridabad.
- "VC" means, the Vice Chancellor, Lingaya’s University, Faridabad.
CODE OF CONDUCT AND ETHICS FOR STUDENTS

1. Wear decent dress respecting his/her modesty as well as that of others.
2. Expected to respect and show regard for teachers, staff and fellow students.
3. Inculcate civic sense and sensitivity for environment protection.
4. Not to resort to collection of funds for any use without written permission of VC.
5. To exhibit exemplary behaviour, discipline, diligences, and good conduct and are a role model to other students.
6. Not to indulge in offences of cognizable nature.
7. Not to practice casteism, communalism.
8. Not to indulge in any other conduct unbecoming of a professional student of the University.
9. Not to outrage the status, dignity and honour of any person.
10. Not to get involved in physical assault or threat, and use of physical force against any body.
11. Not to expose fellow students to ridicule and contempt that may affect their self esteem.
12. Not to form any kind of Students Union, etc.
13. Not to take active or passive part in any form of strikes/protests.
14. To observe all safety precautions while working.
15. Not to disfigure/damage the University property, building, furniture, machinery, library books, fixtures, fittings, etc. (Damage / loss caused shall have to be made good by the students).
16. Use of mobile/video camera phones is strictly prohibited inside the examination halls, class rooms, laboratories and other working places. LU has the right to confiscate the mobile phones in case of any violation.
17. Not to indulge in ragging/teasing, smoking, gambling, use of drugs or intoxicants, drinking alcohol, rude behavior, and use of abusive language.
18. Not to resort to violence, unruly travel in buses, bullying, threatening and coercing others for undesirable act, such as preventing from attending classes, writing exam. / tests, etc.
19. All the students of the LU shall be under the disciplinary control of the VC.
20. Students are deemed to be under the care & guidance of parents. It is obligatory for the former to appraise their progress (given by the CC) to the parents.
21. Fine, if ever imposed, is only to improve discipline and shall be paid promptly.
22. While on campus, students have to take care of their belongings and no responsibility for any loss or damage can be held by the University.
23. Every student shall produce the I-Card on demand, and if lost, get a duplicate issued.
24. The students must attend all lectures, tutorials and practical classes in a course punctually (The attendance will be counted course-wise).
25. To abide by the rules and regulations of the University stipulated from time to time.
IMPORTANT ACADEMIC RULES
Diploma/B.Tech. Degree Programme

GENERAL
- The Regulations may evolve and get revised/refined or updated or amended or modified or changed through approvals from the Academic Council from time to time, and shall be binding on all parties concerned, including the Students, Faculty, Staff, Departments, University Authorities and Officers. Further, any legal disputes shall be limited to the legal jurisdiction determined by the location of the University and not that of any other parties.
- If, at any time after admission, it is found that a candidate had not, in fact, fulfilled all the requirements stipulated in the offer of admission, in any form whatsoever, including possible misinformation etc., the matter will be reported to the AC, recommending revoking the admission of the candidate.
- The University reserves the right to cancel the admission of any student at any stage of his study programme in the University on the grounds of unsatisfactory academic performance or indiscipline or any misconduct.
- Medium of Instruction shall be English.

PROGRAMME
- The normal duration of the programme leading to Diploma/B.Tech.(Integrated) Degree Programme will be six years comprising twelve semesters.
- The Diploma/B.Tech.(Integrated) Degree Programme consists of two modes i.e. (a) Project Mode and (b) with Internship. The university reserves its right to offer any one stream or both streams in whichever combination it deems fit for academic and or administrative reasons.
- The total course package for a Diploma/B.Tech.(Integrated) Degree Programme with Project Mode will typically consist of the following components.
  (i) General courses
  (ii) Humanities Electives
  (iii) Science Foundation
  (iv) Mathematics Foundation
  (v) Engineering Foundation
  (iv) Technical Arts
  (iv) Professional Courses
  (iii) Departmental Core
  (ix) Elective Courses
  An Elective Course can be any of the following:
  a) Departmental Elective
  b) Open Elective:
  (x) Project/Internship (Supervised)
  (xi) Major Project/Internship (Supervised)
  (xii) Industrial Training
  (xiii) Mandatory Learning Courses
Diploma/B.Tech Engineering Programme

- Students will be required to take additional make-up/bridge courses in Mathematics, Science and Language.
- The Diploma/B.Tech.(Integrated) Degree Programme with Internship will typically consist of all the components of the Project Mode as above, however, with different weightage to industrial training and core courses.
- The student has to opt for the Internship Scheme in the eighth semester which will not be revoked in any circumstances. In the absence of exercising the option, it will be presumed that option is for Project Mode.
- A student having registered for Internship Scheme of a programme cannot opt out of that scheme.
- The Minimum Credit Requirement for the Diploma/B.Tech.(Integrated) Degree Programme both for Project Mode and with Internship is – (as decided by BOS) ; however, considering a case for award of honours the minimum credits will be - (as decided by BOS).
- The project will be assigned in eleventh semester. Appropriate double-letter grade is awarded as per the evaluation scheme which will be considered for SGPA and CGPA calculations. It is recommended that an external expert from industry/academia may be a member of the evaluation team of four persons (two professors, external expert and respective project guide).
- MLC must be completed by a student at appropriate time or at his convenience. The ‘S’ grade is awarded for satisfactory completion of the course and ‘N’ grade is awarded for non-satisfactory completion of the course. In case ‘N’ grade is awarded, the student has to re-register for the same course if no alternative options are available. However, one can opt for other courses if provided with multiple options. The ‘S’ and ’N’ grades do not carry grade-points and, hence, are not included in the SGPA and CGPA computations.

Courses that come under this category are the following:
(a) Environment Science and Ecology
(b) Community Service Oriented Project
(c) Professional Development Courses

ASSOCIATION
- Every undergraduate student of the University shall be associated with Parent Department (degree awarding department) offering the degree programme that the student undergoes throughout his study period, right from the very first day of admission into the programme. However, in the first year class he may report to the Dept. of Applied Science and Humanities for administrative/academic purpose.
- A student will be placed in GROUP-A/B for both the semester in an academic year if, and when necessary.
- The schedule of academic activities for a semester, including the dates of registration, mid-semester examinations (MSE), end-semester examination (ESE), inter-semester vacation, etc. shall be referred to as the Academic Calendar of the semester, and announced at least two weeks before the
closing date of the previous semester.

**PRE-REGISTRATION**

- In order to facilitate proper planning of the academic activities of a semester, it is essential for the students to declare their intent to register for a course well in advance, before the actual start of the academic session, through the process of Pre-Registration, which is mandatory for all those students of second or subsequent semester who propose to deviate from recommended scheme of studies.

- Pre-registration is an expression of intention of a student to pursue particular course(s) in the next semester. It is information for planning for next semester. Every effort will be made to arrange for a course opted by the student. However, it is not obligatory on the part of the university to offer the course(s) and no course may be offered if the number of students opting for the course is less than 15 or 25 percent of the admission strength whichever is less.

- If a student fails to pre-register it will be presumed that he will follow suggested normal scheme of studies provided that he is progressing at a normal pace. For remaining students the HOD of the parent department will plan for courses as per the convenience of the department.

**REGISTRATION TO COURSES**

- Every Student after consulting his Faculty-Advisor is required to register for the approved courses with the HOD of parent department at the commencement of each semester on the days fixed for such registration as notified in the academic calendar.

- A student shall register for courses from amongst the courses being offered in the semester keeping in mind the minimum and maximum credits allowed for a degree and other requirements i.e. pre-requisite if any, SGPA and CGPA after consulting the Faculty Advisor. No registration will be valid without the consent of HOD of the parent department.

- A student will be permitted to register in the next semester as per the suggested normal scheme only if he fulfills the following Conditions:
  (a) Satisfied all the Academic Requirements to continue with the programme of studies without termination.
  (b) Cleared all university, library and hostel dues and fines (if any) of the previous semester.
  (c) Paid all required advance payments of the university and hostel for the current semester.
  (d) Not been debarred from registering on any specific ground by the University.

- The students will be permitted to register for course(s) being offered in a semester other than his normal suggested scheme provided that the time table permits.

- The registration in the critical cases will be done as per the priority given below:
Diploma/B.Tech Engineering Programme

(a) Fulfillment of minimum credit requirement for continuation,
(b) The completion of programme in minimum period needed for degree.
(c) Improvement of SGPA/CGPA.
(d) The fulfillment of pre-requisite requirement of courses.

- Students who do not register on the day announced for the purpose may be permitted LATE REGISTRATION up to the notified day in academic calendar on payment of late fee.
- REGISTRATION IN ABSENTIA will be allowed only in exceptional cases with the approval of the DAA after the recommendation of HOD through the guardian of the student.
- Credits will be awarded in registered courses only.

CREDIT LIMITS
- A full time student of the Diploma/B.Tech. (Integrated) degree programme must register for a minimum of 15 credits, and up to a maximum of 31 credits in a Semester. However, the minimum / maximum credit limit can be relaxed by the DAA on the recommendation of the HOD, only under exceptional circumstances. The maximum credits that a student can register in a Summer Term are 8.
- Professional Development courses are one credit courses each, with multiple options, to be completed at student's convenience in each Semester. Some of them may be mandatory and others two-letter grade category. However, registration has to be done for all courses.

CHANGE IN REGISTRATION
- A student has the option to ADD courses for registration till the date specified for late registration in the Academic Calendar.
- On recommendation of the Teaching Department as well as the Parent Department, a student has the option to DROP courses from registration until two weeks after the commencement of the classes in the semester, as indicated in the Academic Calendar.
- A student can register for auditing a course, or a course can be converted from credit to audit or from audit to credit, with the consent of the Faculty Advisor and Course Instructor within two weeks after the commencement of the classes in the semester as indicated in the Academic Calendar. However, CORE Courses shall not be available for audit.

ATTENDANCE REQUIREMENTS
- LU academic programmes are based primarily on the formal teaching-learning process. Attendance in classes, participating in classroom discussions and participating in the continuous evaluation process are the most essential requirements of any academic programme.
- Attendance will be counted for each course scheduled teaching days as per the academic calendar.
- The attendance requirement for appearing in end semester examination shall be a minimum of 75% of the classes scheduled in each course.
LEAVE OF ABSENCE

- The leave of absence must be authorized as per regulations.
- A student short of attendance in a course (less than needed after leave of absence and condonation by VC) will be awarded ‘FF’ grade in the course.
- All students must attend all lecture, tutorial and practical classes in a course. The attendance will be counted course wise.
- To account for approved leave of absence e.g. representing the University in sports, games or athletics; professional society activities, placement activities, NCC/NSS activities, etc. and/or any other such contingencies like medical emergencies, etc., the attendance requirement shall be a minimum of 75% of the classes scheduled in each course to appear in the examination.
- A student with less attendance in a course during a semester, in lectures, tutorials and practicals taken together as applicable, shall be awarded ‘FF’ grade in that course, irrespective of his academic performance, and irrespective of the nature of absence.
- If the period of leave is more than three days and less than two weeks, prior application for leave shall have to be submitted to the HOD concerned, with the recommendation of the Faculty-Advisor, stating fully the reasons for the leave requested, along with supporting documents.
- If the period of leave is two weeks or more, prior application for leave shall have to be made to the DAA with the recommendations of the Faculty-Advisor, HOD concerned stating fully the reasons for the leave requested, along with the supporting documents. The DAA may, on receipt of such application, grant leave or decide whether the student be asked to withdraw from the course for that particular semester because of long absence.
- If a student fails to apply and get sanction for absence as in (a) and (b) above, his parent/guardian may apply to the VC with reasons duly recommended by the faculty advisor, HOD and DAA and explain in person to the VC the reasons for not applying in time. The VC will consider on merit and decide to grant the leave or withdrawal from the course for that particular semester subject to any condition that he may like to impose. The decision of the VC shall be final and binding.

ABSENCE DURING EXAMINATIONS

- A student who has been absent during MSE due to illness and/or any exigencies may give a request for make-up examination within one week after the MSE to the HOD with necessary supporting documents in person. The HOD may consider such requests depending on the merit of the case, and after consultation with the Course Instructor, may permit the make-up examination for the student concerned. However, no make-up examination will be permitted if the attendance in the course is less than 60% till the date of examination.
- In case of absence from End-Semester Examination of a course(s) on Medical ground and/or other special circumstances, the student can apply for award of ‘I’ grade in the course(s) with necessary supporting documents and
certifications by an authorized person to the HOD within one week after the End-Semester Examination. The HOD may consider the request, depending on the merit of the case, and after consultation with the Course(s) Instructor(s)/ faculty advisor may forward the case to DAA with his recommendation for the award of ‘I’ grade. After permission by DAA in writing, the ‘I’ Grade is converted into a regular double letter grade on the basis of the students’ marks in Mid-Semester Test and Class Work. However, if a student has scored 50% or more marks in Mid-Semester Test plus Class work his/her marks will be increased by 50% before awarding the grade. This applies to both theory and practical courses.

COURSE CREDIT ASSIGNMENT
- Every course comprises of specific Lecture-Tutorial-Practical (L-T-P) schedule. The credits for various courses are shown in the Scheme of Studies & Syllabus.
- The Academic Performance Evaluation of a student shall be according to a Letter Grading System, based on the Class Performance Distribution.
- The double-letter grade (AA, AB, BB, BC, CC, CD, DD, EE, FF) indicates the level of academic achievement, assessed on a decimal (0-10) scale.

Letter-Grades and Grade-Points:

<table>
<thead>
<tr>
<th>LETTER- GRADE</th>
<th>GRADE-POINTS</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>AB</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>BB</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>BC</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>CD</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>DD</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>EE</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>FF</td>
<td>0</td>
<td>Fail</td>
</tr>
<tr>
<td>I</td>
<td>-</td>
<td>Incomplete</td>
</tr>
<tr>
<td>U</td>
<td>-</td>
<td>Audited</td>
</tr>
<tr>
<td>W</td>
<td>-</td>
<td>Withdrawal</td>
</tr>
<tr>
<td>S</td>
<td>-</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>N</td>
<td>-</td>
<td>Unsatisfactory</td>
</tr>
</tbody>
</table>

DESCRIPTION OF GRADES
- An ‘AA’ grade stands for outstanding performance, relative to the class which may include performance with previous batches. The Course Instructor is supposed to take utmost care in awarding of this highest double-letter grade.
- The 'DD' grade stands for marginal performance and is the minimum passing double-letter grade.
- An ‘EE’ grade indicates that the student has attended the course but obtained less than pass marks. In this case he will earn half the credits
assigned to the course.

- The ‘FF’ grade denotes very poor performance, i.e. failure in a course, and the Course Instructor is supposed to take utmost care while awarding this lowest double-letter grade. The ‘FF’ grade due to detention is denoted by ‘FF*’.

- A student, who obtains 'FF' grade in a core course due to detention in attendance, has to repeat (re-register) course in subsequent semesters /sessions whenever the course is offered. In other cases of ‘FF’ Grade, a student has three options as follows:
  a) Repeat the course,
     Or
  b) Only appear in End-Semester Examination in a subsequent semester and evaluated out of 60 marks for new grade computation. The new grade will be computed out of 100 marks as follows:
     ESE = 60 (against 40 marks for the regular students)
     CW + Attendance = 30+10, to be brought forward from the earlier semester.
     Or
  c) Get the course converted into a partially dropped course to earn two grade points but earn only half the credits meant for that course. It could be termed as two letter grade ‘EE’.

However, for an elective course in which ‘FF’ grade has been obtained, the student may overcome the deficiency either in the same course or any other elective course.

There are four possible ways of clearing backlog courses and improvement of grades: Subsequent Semester; Summer Term; Week Ends; after University hours with the following overriding conditions – (i) There will be minimum 60% of contact hours of a regular course in a semester for doing backlog in any mode, (ii) The attendance requirement shall be a minimum of 75% of the classes scheduled in each course without any condonation.

- An 'I' grade denotes incomplete performance in any course due to absence at the End-Semester Examination (see Section “Absence during Examination”).

- ‘U’ grade is awarded in a course that the student opts to register for audit. It is not mandatory for the student to go through the entire regular process of evaluation in an audit course. However, the student has to go through some process of minimal level of evaluation and also the minimum attendance requirement, as stipulated by the Course Instructor and approved by the corresponding BOS, for getting the ‘U’ grade awarded in a course, failing which that course will not be listed in the Grade Card.

- A 'W' grade is awarded when the student withdraws from the course. Withdrawal from a course is permitted only under extremely exceptional
Diploma/B.Tech Engineering Programme

circumstances (like medical emergencies, family tragedies and/or other unavoidable contingencies) and has to be recommended by the HOD and approved by the DAA. However, no withdrawal is permitted after the finalization of the grades in the semester.

- ‘S’/’N’ grades are awarded for the Mandatory Learning Courses. The ‘S’ grade denotes satisfactory performance and completion of a course. The ‘N’ grade is awarded for non-completion of course requirements and the student will have to register for the course until he obtains the ‘S’ grade.

FEEDBACK TO STUDENTS

- A student requires feedback on the progress of his learning. For this purpose, the Instructor will conduct three quizzes for a theory course in a semester 1st before MSE-1, 2nd between MSE-1 and MSE-2 and 3rd after MSE-2. The quizzes will form a component of class work, the other components being tutorials, home assignments or any other mode.
- For a laboratory course, the continuous assessment’s feedback will be given through the laboratory records which are required to be submitted after performing the experiment in the next laboratory class.
- The continuous feedback on project/major project will be through project diary and interim report.
- For Internship stream, the continuous assessment and feedback is to be through seminars, professional diary and interim reports at the place of work.

EVALUATION

Theory Course:

- The double-letter grade awarded to a student in a course other than a practical course, i.e. L-T-0 course for which he has registered, shall be based on his performance in quizzes, tutorials, assignments etc., as applicable, in addition to two MSEs and ESE. The weightage of these components of continuous evaluation may be as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weightage</th>
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<tbody>
<tr>
<td>End-Semester Examination (ESE) (3 hrs)</td>
<td>40%</td>
</tr>
<tr>
<td>Mid-Semester Examinations (MSE) (2×10%;1 ½ hrs each)</td>
<td>20%</td>
</tr>
<tr>
<td>3Quizzes (3×5), Tutorials, Assignments, etc. (Several over the semester)</td>
<td>30%</td>
</tr>
<tr>
<td>Attendance</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Laboratory Course:

- The double letter grade awarded to the student in a practical course i.e. 0-0-P course will be based on his performance in regular conduct of experiments, viva voce, laboratory reports, quizzes etc. The weightage of the components of continuous evaluation may be as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduct of Experiments (as per syllabus)</td>
<td>50%</td>
</tr>
<tr>
<td>Lab Records</td>
<td>20%</td>
</tr>
</tbody>
</table>
Quizzes/Viva Voice +Attendance (10%) : 30%

Total : 100%

Project (Including Seminar):
- The double letter grade awarded to the student in Project (Including Seminar) i.e. 0-0-P course will be based on his performance in technical work pertaining to the solution of a small size problem, project report, and presentation of work and defending it in a viva-voce. The weightage of the components of continuous evaluation may be as follows:
  - Technical Work : 50%
  - Report : 25%
  - Seminar, Presentation & Viva-voce : 25%
  - Total : 100%

Major Project:
- The double letter grade awarded to the student in Major Project Phase-I and Phase-II i.e. 0-0-P course will be based on his performance in technical work pertaining to the solution of a problem, project report, presentation and defending in a viva-voce. The weightage of the components of continuous evaluation may be as follows:
  - Technical Work : 50%
  - Report : 25%
  - Presentation & Viva-voce : 25%
  - Total : 100%

Internship:
- The Internship-II will be treated as Major Project for evaluation purpose. The double letter grade awarded to the student in Internship-II i.e. 0-0-P course will be based on his performance in technical work pertaining to the solution of a real-life problem, project report, presentation and defending in a viva-voce. The weightage of the components of continuous evaluation may be as follows:
  - Technical Work : 50%
  - Report : 25%
  - Presentation & Viva-voce : 25%
  - Total : 100%

The continuous assessment and feedback is to be through seminars, professional diary and interim report(s) at the place of work.

Seminar:
- The double letter grade awarded to the student in Seminar i.e. 0-0-P course will be based on his performance in oral presentation with emphasis on technical contents, presentation and ability to answer questions. The weightage of the components of continuous evaluation may be as follows:
  - Technical Contents : 40%
  - Presentation : 30%
  - Questions and answers : 30%
  - Total : 100%
Industrial/Field Training/Internship-I:
- The double letter grade awarded to the student in Industrial/Field Training/Internship-I i.e. 0-0-P course will be based on Practical Training/Internship-I in an industry, professional organization/ research laboratory. The components of continuous evaluation with weightage may be as follows:
  - Training report : 40%
  - Presentation : 30%
  - Questions and answers : 30%
  - Total : 100%

Professional Development(PD):
- The PD courses carry one (1) credit each. The evaluation process of these courses will be as per the nature, contents and delivery of these courses. Some of the common components of evaluation could be quizzes, viva-voce, practical test, group discussion, etc. Participation by students is to be given more weightage in Co-curricular courses.

SCHEME OF EXAMINATION
- The duration of examinations for a theory course will be 3 hours for ESE and 1½ hours for MSE.
- The pattern of question paper/examination will be as under:
  - Theory Courses:
    The University shall conduct the ESE for all theory courses being taught in the semester.
    i) There will be eight questions in all distributed over all the units in a course syllabus. The question paper will be in two parts with weightage 20 percent and 80 percent respectively. The paper setter must set the questions such that each question can be answered in about 35 minutes and the paper can be solved in 3 hours by an average student.
    ii) Part-A will have one question of objective type with parts having multiple choices, covering all the units in the syllabus, which will be compulsory.
    iii) Part-B will consist of seven questions, one question from each of the seven units, and the students are required to solve any four. Out of seven any three questions will have long answers of comprehensive/ derivation/description type and the remaining four questions will be of problem solving type in order to measure ability on analysis/synthesis/application.
    iv. If any special instruction(s) is/are required for a particular course, it/they is/are to be specified by the concerned HOD with prior approval of DAA.
- Students are allowed in the examination the use of single memory, non-programmable calculator. However, sharing of calculator is not permitted.
• **Laboratory Courses:**
  Each experiment may be considered as a unit and evaluated to assess formative and cumulative performance say each of the experiments which carries 10 marks with distribution 5+2+3. Finally, the teacher looks at attendance and total earned marks in the experiments done in a Semester/Year and awards the grades relatively.

• **Mid-Semester Examination:**
  The question paper for Mid-Semester Examination will be made by the Course Coordinator from the topics covered till then (Test-1: from start of semester till Test-1 and Test-2, from after Test-1 till Test-2). Each Mid-Semester Examination question paper should have three questions all of which are to be solved but the questions will have internal choice and at least one of these questions must be of analytical type.
  **Note:** The Mid-Semester examination will not have multiple choice question (mcq).

**TRANSPARENCY**

- The answer books of all MSE and ESE will be shown to the students within three days of the last paper. It is the responsibility of the student to check his/her evaluated answer books and affix his/her signature in confirmation.
- If the student finds some discrepancy, he should bring it to the notice of the Course Coordinator. The Course Coordinator will look into the complaint and remove the doubts of the student and proceed with the work of grading.
- The entire process of evaluation shall be transparent, and the course instructor shall explain to a student the marks he is awarded in various components of evaluation.

**RESULT**

- The final marks and grades shall be displayed on the notice board and a student can approach the Course Instructor(s) concerned for any clarification within the period stipulated in the Academic Calendar. The process of evaluation shall be transparent and the students shall be made aware of all the factors included in the evaluation. In case of any error/correction, the Course Instructor shall have to incorporate the same before finalization of the grades.
- The Student’s Grade Card shall contain the Letter-Grade for each registered course; along with the SGPA at the end of the semester, and the CGPA at the completion of the programme.

**APPEAL FOR REVIEW OF GRADE**

- If a student is not satisfied with the award of the grade after the announcement of the grades, he may appeal on a Grievance Form duly filled in along with the fee receipt for this purpose to the HOD of the parent department within one week of the following semester. The HOD will forward the form along with his recommendation based on the records of the case to DAAB within the date specified in the Academic Calendar.
Diploma/B.Tech Engineering Programme

- The fee for such an appeal will be decided from time to time. If the appeal is upheld by DAAB, then the fee amount will be refunded to the student without interest.
- VC shall have power to quash the result of a candidate after it has been declared, if
  (a) He is disqualified for using malpractice in the examination;
  (b) A mistake is found in his result;
  (c) He is found ineligible to appear in the examination

EVALUATION OF PERFORMANCE
- The overall performance of a student will be indicated by two indices:
  (i) SGPA which is the Semester Grade Point Average
  (ii) CGPA which is the Cumulative Grade Point Average

**SGPA for a Semester is computed as follows:**

\[ \text{SGPA} = \frac{\sum C_i G_i}{\sum C_i} \]

Where,
- \( C_i \) denotes credits assigned to \( i^{th} \) course with double-letter grade, and \( G_i \) denotes the grade point equivalent to the letter grade obtained by the student in \( i^{th} \) course with double-letter grade, including all ‘FF’ grades in that semester.

**CGPA is computed as follows:**

\[ \text{CGPA} = \frac{\sum C_i G_i}{\sum C_i} \]

Where,
- \( C_i \) denotes credits assigned to \( i^{th} \) course with double-letter grade, and \( G_i \) denotes the grade point equivalent to the letter grade obtained by the student in \( i^{th} \) course for all courses with double-letter grades, including all ‘FF’ grades in all semesters at the end of the programme.

For CGPA calculation, the following grades are to be counted:
- (i) Grades in all core courses,
- (ii) The best grades in the remaining eligible courses to fulfill the minimum credits requirement for a programme.

B. TECH. DEGREE REQUIREMENTS
The degree will be awarded only upon compliance of all the laid down requirements for programme.

- The requirements of the award of B.Tech. Degree programme are as follows:
  (i) **University Requirements:**
      (a) Minimum Earned Credit Requirement for Degree is (as decided by BOS) for regular programme. However, the credits required for consideration for honours degree will be (as decided by BOS).
      (b) Satisfactory completion of all Mandatory Learning Courses.
  (ii) **Programme Requirements:**
       Minimum Earned Credit Requirements on all Core Courses, Elective Courses and Major Project/Internship as specified by the BOS.
  (iii) The CGPA at the end of programme is atleast 5.0.
  (iv) The Maximum duration for a student for complying with the Degree
Requirement is EIGHT years from date of first registration for first Semester.

(v) Notwithstanding above, a student can leave the programme after completion of six semesters if he/she so desires. Such a student will be awarded Diploma in Engineering for which the minimum credit requirement is 140.

**AWARD OF DIVISIONS**
- The candidate will be placed in First Division with Honours/First Division with Distinction/First Division/Second Division which will be mentioned on the degree certificate as under:

<table>
<thead>
<tr>
<th>DIVISION</th>
<th>CONDITIONS TO BE FULFILLED</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Division with Honours</td>
<td>CGPA ≥ 8.5</td>
</tr>
<tr>
<td></td>
<td>No ‘EE’, ‘FF’ N or W grade in any course during the programme and total credits (as decided by BOS).</td>
</tr>
<tr>
<td>First Division with Distinction</td>
<td>CGPA ≥ 8.5</td>
</tr>
<tr>
<td>First Division</td>
<td>CGPA ≥ 6.75</td>
</tr>
<tr>
<td>Second Division</td>
<td>CGPA ≥ 5.0 but &lt; 6.75</td>
</tr>
</tbody>
</table>

**Note:** Although, there is no direct conversion from grades to marks, however, for comparison purposes percentage of marks may be assumed to be CGPA multiplied by nine.

**GRADE IMPROVEMENT**
- A student may be allowed to improve the SGPA in an appropriate Semester, if his SGPA falls below 5.0. Similarly, any student may be allowed to improve performance in any course provided the course is being floated and available.

**TERMINATION FROM THE PROGRAMME**
- A student shall be required to leave the University without the award of the Degree, under one or more of the following circumstances:
  - If a student fails to earn the minimum credits specified below:

<table>
<thead>
<tr>
<th>CHECK POINT</th>
<th>CREDIT THRESHOLD** (Percentage of Credits of Theory Courses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>End of FIRST year</td>
<td>70*</td>
</tr>
<tr>
<td>End of SECOND year</td>
<td>75*</td>
</tr>
<tr>
<td>End of THIRD year</td>
<td>80</td>
</tr>
<tr>
<td>Thereafter</td>
<td>as decided by BOS</td>
</tr>
</tbody>
</table>

**Note 1:**
- A student may be given one more chance to cover the shortfall in the threshold at the end of each one of the first two years during the following summer term if s/he can fulfill the requirement by doing two courses. In case s/he fails to clear the threshold even after the
summer term he has to leave the course.

** If at any stage, a student fails to cross the threshold with a minimum of 5.0 SGPA in any semester, he will be treated as critical case and will be advised to improve the grades.

**Note 2:** The period of temporary withdrawal (refer: Clause No. G8.1) is not to be counted for the above Credit Threshold.

(b) If a student is absent for more than 4 (Four) weeks at a stretch in a Semester without sanctioned leave.

(c) Based on disciplinary action by the AC, on the recommendation of the appropriate committee.

**Note:** Under any circumstances of termination, the conditions specified in Permanent. Withdrawal (refer: Clause No: G8.2) shall also apply.

**WITHDRAWAL FROM PROGRAMME**

**Temporarily:**
- A student who has been admitted to a degree programme of the University may be permitted to withdraw temporarily, for a period of one semester or more, on the grounds of prolonged illness or grave calamity in the family, etc., provided:
  (i) He applies to the University stating fully the reasons for withdrawal together with supporting documents and endorsement from his parent/guardian
  (ii) There are no outstanding dues or demands, from the Departments/University/Hostels/Library and any other centers;
  (iii) Scholarship holders are bound by the appropriate Rules applicable to them.
  (iv) The decision of the VC of the University regarding withdrawal of a student is final and binding.

- Normally, a student will be permitted only one such temporary withdrawal during his tenure as a student and this withdrawal will not be counted for computing the duration of study.

**Permanently:**
- Any student who withdraws permanently admission before the closing date of admission for the academic session is eligible for the refund of fee as per the University rules. Once the admission for the year is closed, the following conditions govern withdrawal of admission:
  - A student who wants to leave the University for good, will be permitted to do so (and take Transfer Certificate from the University, if needed), only after clearing all the dues for the remaining duration of the course.
  - A student who has received any scholarship, stipend or other form of assistance from the University shall repay all such amounts, in addition, to clearing all the dues for the remaining duration of the course.
  - The decision of the VC regarding all aspects of withdrawal of a student shall be final and binding.
## Scheme of Studies
### Diploma/B.Tech.(Integrated) in Mechanical Engineering

#### 2nd Year
##### Semester-III

### THEORY

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course No.</th>
<th>Course Name</th>
<th>Periods L-T-P</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ME201D</td>
<td>Strength Of Materials</td>
<td>3-1-0</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>ME202D</td>
<td>Thermodynamics</td>
<td>3-1-0</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>EL215D</td>
<td>Basic of Electrical and Electronics Engineering</td>
<td>3-0-0</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>ME203D</td>
<td>Workshop Technology – I</td>
<td>3-0-0</td>
<td>3</td>
</tr>
</tbody>
</table>

### PRACTICAL / DRAWING / DESIGN

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course No.</th>
<th>Course Name</th>
<th>Periods L-T-P</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ME251D</td>
<td>Strength Of Materials Lab</td>
<td>0-0-2</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>ME252D</td>
<td>Thermodynamics Lab</td>
<td>0-0-2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>EL265D</td>
<td>Basic of Electrical and Electronics Engineering Lab</td>
<td>0-0-2</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>ME253D</td>
<td>Workshop Practice – I Lab.</td>
<td>0-0-8</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>ME254D</td>
<td>Machine Drawing Lab</td>
<td>0-1-4</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>PD291</td>
<td>Co-curricular Activities</td>
<td></td>
<td>1*</td>
</tr>
</tbody>
</table>

### TOTAL CONTACT HOURS | TOTAL CREDITS
---|---
12-3-18(33) | 24

**FINAL EVALUATION IN GRADES**

(L-T-P-Cr) - Lectures-Tutorials-Practical-Credits
MSE – Mid-Semester Examination
ESE – End-Semester Examination

* One credit to be earned in Semester-IV through Co-Curricular Activities outside contact hours. However, a student is to register for this course in both the Semesters of the year.
### Semester-IV

#### THEORY

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course No.</th>
<th>Course Name</th>
<th>Periods</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ME205D</td>
<td>Materials and Metallurgy</td>
<td>3-0-0</td>
<td>3</td>
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<tr>
<td>2</td>
<td>ME206D</td>
<td>Hydraulics and Hydraulic Machines</td>
<td>2-0-0</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>ME207D</td>
<td>Applied Thermodynamics</td>
<td>3-0-0</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>ME208D</td>
<td>Workshop Technology – II</td>
<td>3-0-0</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>ME209D</td>
<td>Machine Design and Drawing</td>
<td>2-2-0</td>
<td>4</td>
</tr>
</tbody>
</table>

#### PRACTICAL / DRAWING / DESIGN

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course No.</th>
<th>Course Name</th>
<th>Periods</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ME255D</td>
<td>Materials and Metallurgy Lab</td>
<td>0-0-2</td>
<td>1</td>
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<tr>
<td>2</td>
<td>ME256D</td>
<td>Hydraulics and Hydraulic Machines Lab</td>
<td>0-0-2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>ME257D</td>
<td>Applied Thermodynamics Lab</td>
<td>0-0-2</td>
<td>1</td>
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<tr>
<td>4</td>
<td>ME258D</td>
<td>Workshop Practice – II Lab.</td>
<td>0-0-8</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>CS265D</td>
<td>Computer Application in Mechanical Engineering Lab</td>
<td>0-0-2</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>PD292D</td>
<td>Entrepreneurship and Professional Skills (MLC)</td>
<td>0-0-2</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>PD291D</td>
<td>Co-curricular Activities</td>
<td></td>
<td>1*</td>
</tr>
</tbody>
</table>

**TOTAL CONTACT HOURS** | **TOTAL CREDITS**

| 13-2-18(33) | 24+1* |

FINAL EVALUATION IN GRADES
(L-T-P-Cr) - Lectures-Tutorials-Practical-Credits
MSE – Mid-Semester Examination
ESE – End-Semester Examination

* One credit to be earned in Semester-IV through Co-Curricular Activities outside contact hours. However, a student is to register for this course in both the Semesters of the year.
IMPORTANT NOTES

1. Laboratory Courses are being offered as distinct courses (0-0-P) without being mixed with lecture components.

2. Conduct of Lab Courses:
   a. At least ten experiments/programs are to be performed in a term.
   b. Experiment means experiment or programme or practical or exercise or job or taks.
   c. It is expected that more experiments/programs are designed and set as per the scope of the syllabus, which may be added to the above list.
   d. One or more than one experiments/programs may be performed in one lab period in order to utilize the time properly.
   e. The scheme of operation is to be approved by HOD.

3. Students are allowed in the examination the use of single memory, non-programmable calculator. However, sharing of calculator is not permitted.
DETAILLED SYLLABUS  
( Diploma/B.Tech.(Integrated) in Mechanical Engineering)

<table>
<thead>
<tr>
<th>CS265D</th>
<th>COMPUTER APPLICATIONS IN MECHANICAL ENGINEERING LAB</th>
<th>L-T-P</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0-0-2</td>
<td>1</td>
</tr>
</tbody>
</table>

LIST OF PRACTICALS

1. **Computer Application Overview**: Commercial and business data processing applications; engineering computation.

2. **MS Power Point**: Introduction; elements of power point package; templates, wizards, views, color schemes; starting power point; exploring power point menus; starting a new slide; adding title, text and art; moving text area and resizing text box; starting a slide show; saving a presentation; printing slides. Inserting and deleting slides; closing a presentation; exercise for making a presentation and slide show; views- power point views; slide view, outline view, slide sorter view, notes view, slide show view, slide setup zoom in; zoom out; exercises on various views of presentation.

3. **Formatting and Enhancing Text**: Formatting; changing format with a new layout; alignment of text and text spacing; enhancing text formatting use of bullets, changing text font and size; selecting text style and color; applying design template; closing and applying the transition; spell checking; to set header and footer; exercise on formatting text and applying design template.

4. **Slides with graphs**: Creating a graph; adding graphic objects; adding clipart pictures; adding movies and sound; adding multimedia to presentation; inserting excel worksheet or word table; exercise on inserting graphs, tables, movies and clipart.

5. **MS– Access**: Introduction to Microsoft access; components of access; Table creating; starting access, creating tables, tool bars and views of tables; editing the design and contents of the table; creating relationship between tables; adding OLE objects to a table; use of import and export facility; exercise on table creating; query handling; creating a new query, use of criteria, expressions and operations; editing.

6. **Form designing**: Introduction; creating a form; modify a form design; designing a form using design view; sub forms; printing the forms; exercise on form designing. Report designing; creating a report; managing the different controls of the records; saving and printing the report; use of graphs in reports; exercise on report designing query; editing query.

7. **C++ Fundamentals**: Introduction; oop; character set; C++ tokens; keywords; identifiers; constants; basic data type; declaration of variables; defining symbolic constants; assignment statement; comments in a programme structure of C++ programme; output using COUT; output using CIN; manipulators; Operators and Expressions; Arithmetic operators, relational operators; logical operators; shorthand assignment operator; increment and decrement operators; conditional operators; bit wise operators; precedence in C++ operators; casting of data; standard mathematical functions; control structures:IF statements, IF---ELSE statements; nested IF statements;
switch statements; Go To statements; repetitive structures; while statements; 
do statement; for loop; break statement; continue statement; nested loops.

REFERENCE BOOKS
   Ltd..

<table>
<thead>
<tr>
<th>EL215D</th>
<th>BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING</th>
<th>L-T-P</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3-0-0</td>
<td>3</td>
</tr>
</tbody>
</table>

OBJECTIVE
The objective of the course is to impart basic knowledge and skills regarding 
electrical engineering. Which diploma holders will come across in their professional 
life.

1. **Application and Advantage of Electricity**: Difference between AC and DC; 
   various applications of electricity; advantages of electrical energy over other 
types of energy; definition of voltage; current; power and energy with their 
units; name of the instruments used for measurement of quantities A.C.& D.C. 
connection of the instruments in electric circuit.
2. **Electromagnetic Induction**: Production of e.m.f, idea of a transformer and its 
   working principle.
3. **Distribution System**: Difference between high and low voltage distribution 
   system; identification of three-phase wire; neutral wires and earth wire in a low 
voltage distribution system; identification of voltage between phases and 
between one phase and neutral; difference between three-phase and single-
phase supply.
4. **Domestic Installation**: Distinction between light and fan circuits and single 
   phase power circuit; sub circuits; various accessories and parts of electrical 
installation; identification of wiring systems; common safety measures and 
earthling.
5. **Electric Motor**: Definition and various applications of single-phase and three-
   phase motors; connection and starting of three-phase induction motors by 
star-delta starter; changing direction of rotation of a given three phase 
induction motor.
6. **Electrical Safety**: Electrical shock and precautions against shock; treatment 
of electric shock; concept of fuses and their classification; selection and 
application; concept of earthing and various types of earthingl application of 
MCBs and ELCBs.
7. **Basic Electronics**: Basic idea of semiconductors – P and N types; diodes; 
zener diodes and their applications; transistor – PNP and NPN; their 
characteristics and uses; characteristics and application of a thyristor; 
characteristics and applications of servo motors.
TEXT BOOK

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>EL265D</th>
<th>BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING LAB</th>
<th>L-T-P</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0-0-2</td>
<td>1</td>
</tr>
</tbody>
</table>

LIST OF PRACTICALS
1. Connection of a three-phase motor and starter with fuses and reversing of direction of rotation.
2. Connection of a single-phase induction motor with supply and reversing of its direction of rotation.
3. Charging of a lead-acid battery.
4. Troubleshooting in domestic wiring system.
5. Connection and reading of an electric energy meter.
7. Use of ammeter, voltmeter, wattmeter, energy meter and multi-meter.
8. Ohm’s Law verification.
10. Verification of law of resistance in parallel.
11. Study of different types of fuses.
12. Study of earthing practices.

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>ME201D</th>
<th>STRENGTH OF MATERIALS</th>
<th>L-T-P</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3-1-0</td>
<td>4</td>
</tr>
</tbody>
</table>

OBJECTIVE
Diploma holders in this course are required to analyze reasons for failure of different components and select the required materials for different applications; For this purpose; it is essential to teach them concepts; principles; applications and practices covering stress; strain; bending moment; shearing force; shafts; columns and springs; Hence this subject has been introduced; It is expected that efforts will be made to provide appropriate learning experiences in the use of basic principles to the solution of applied problems to develop the required competencies.
1. **Stresses and Strains**: Concept of load; stresses and strain; tensile; compressive and shear stresses and strains; concept of elasticity; elastic limit and limit of proportionality; Hooke’s Law; Young’s Modulus of elasticity; strain hardening; stress strain diagram; principle of superposition; temperature stresses and strains; composite sections under compression and tension; lateral strain; Poisson’s ratio; numerical problems.

2. **Beams and Bending Stress**: Concept of beams; types of beams; types of loading; concept of bending moment and shearing force; bending moment and shearing force diagram for cantilever and simply supported beams with and without overhang subjected to concentrated and UDL; point of contraflexure; numerical problems.

3. **Moment of Inertia Concept**: Second moment of area; radius of gyration; theorem of parallel axes; theorem of perpendicular axes; section modulus; moment of inertia of plane figures such as rectangle; square; triangle; circle; trapezium (without proof); numerical problems on: angle section; T section; I section; circular section; channel section; Z Section; hollow section and removed section.

4. **Bending Stress**: Concept of bending stresses; theory of simple bending; assumptions made in bending theory; use of equation \( \sigma = \frac{M}{I} = \frac{E}{R} \); concept of moment of resistance; calculation of maximum bending stress in beams of rectangular; and T sections.

5. **Columns**: Concept of column; modes of failure; types of columns; buckling load; crushing load; slenderness ratio; factors effecting strength of a column; end restraints; effective length; strength of column by Euler Formula (without derivation); Rankine Gourdan formula without derivation; numerical problems.

6. **Torsion**: Concept of Torsion; difference between torque and torsion; derivation and use of Torque equation; comparison between solid and hollow shaft with regard to their strength and weight; power transmitted by shaft; concept of mean and maximum torque; numerical problems.

7. **Springs**: Determination of number of plates; maximum bending stress and deflection; closed coil helical spring subjected to axial load; stress deformation stiffness and angle of twist and strain energy; falling loads on springs; numerical problems.

**TEXT BOOK**

**REFERENCE BOOKS**
1. Malhotra D.R., ”Strength of Materials”, Satya Prakashan, Delhi
OBJECTIVE
A diploma holder in mechanical engineering is supposed to maintain steam generators; turbines and other power plant equipment; In addition he is required to maintain various types of automobiles, therefore, it is essential to teach him concepts, principles and applications of basic thermodynamics; steam generators; steam turbine and other power plant equipment; non-conventional energy sources and about IC engines; Hence this subject.

1. **Fundamental Concepts**: Thermodynamic state and system boundary; surrounding; universe; thermodynamic systems; closed; open; isolated; adiabatic; homogeneous and heterogeneous; macroscopic and microscopic; properties of system – intensive and extensive; thermodynamic equilibrium; quasi – static process; reversible and irreversible processes; zeroth law of thermodynamics; definition of properties like pressure; Volume; temperature; enthalpy; internal energy.

2. **Laws of Perfect Gases**: Definition of gases; explanation of perfect gas laws; Boyle’s law; Charles’s law; Avagadro’s law; Renault’s law; universal gas constant; characteristic gas constants; derivation; specific heat at constant pressure; specific heat at constant volume of gas; derivation of an expression for specific heats with characteristics; simple problems on gas equation.

3. **Thermodynamic Processes of Gases**: Types of thermodynamic processes; isochoric isobaric; isothermal; hyperbolic; isentropic; polytrophic and throttling processes; equations representing the process; derivation of work done; change in internal energy; change in entropy; rate of heat transfer for the above processes.

4. **Laws of Thermodynamics**: Laws of conservation of energy; first law of thermodynamics (Joule’s experiment); application of first law of thermodynamics to non-flow systems; constant volume; constant pressure; adiabatic and polytrophic processes; steady flow energy equation; Heat source and heat sinks; statement to second laws of thermodynamics; Kelvin Planck’s statement; Classius statement; equivalence of statements; perpetual motion machine of first kind; second kind; (PMM1; PMM2); Carnot engine; Introduction of third law of thermodynamics; concept of irreversibility; Entropy.

5. **Properties of Steam**: Formation of steam and related terms; thermodynamics properties of steam; steam tables; internal latent heat; internal energy of stream; entropy of water; entropy of steam; T- S diagrams; Mollier diagram (H – S Chart); expansion of steam; hyperbolic; reversible adiabatic and throttling processes.

6. **Fuels and Combustion**: Definition of fuel; types – solid; liquid and gaseous fuels; Examples; Uses of different types of fuels; Calorific values of fuels; Dulong’s formula for calorific value; calculation of calorific values; chemical composition of a fuel; bomb calorimeter unit description, procedure for determination of C_V of solid or liquid fuel using bomb calorimeters, calculation of C_V with test data.
7. **Air Standard Cycles:** Meaning of air standard cycle; Its use, condition of reversibility of a cycle; description of Carnot cycle; Otto cycle; Diesel cycle; simple problems on efficiency.

**TEXT BOOK**

**REFERENCE BOOKS**

<table>
<thead>
<tr>
<th>ME203D</th>
<th>WORKSHOP TECHNOLOGY – I</th>
<th>L-T-P</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3-0-0</td>
<td>3</td>
</tr>
</tbody>
</table>

**OBJECTIVE**
Diploma holders are responsible for supervising production processes to achieve production targets and for optimal utilization of resources; For this purpose, knowledge about various machining processes, modern machining methods, processing of plastic, CNC machining, tool, jigs and fixtures is required to be imparted; Hence the subject of workshop technology.

1. **Welding Process:** Principle of welding; welding positions and techniques; symbols; gas welding types of gas welding flames and their applications; gas welding equipments; gas welding torch; Oxy- acetylene cutting torch; blowpipe; pressure regulators; filler rods and fluxes.
2. **Arc Welding:** Arc welding machines and equipment; AC and DC Arc welding; effect of polarity; current regulation and voltage regulation; electrodes; classification; B.IS specification and selection; Flux for arc welding.
3. **Modern Welding Methods:** Principle of operation; advantages; disadvantages and applications of Tungsten inert gas (TIG) welding; metal inert gas (MIG) welding; thermit welding; electro slag welding.
4. **Pattern Making:** Types of pattern; pattern material; pattern allowances; pattern codes as per BIS; introduction to cores; core boxes; and core materials; core making procedure; core prints; positioning of cores.
5. **Mould Making:** Introduction to moldings tools; types of moulds; step involved in making a mould; mouldings boxes; hand tools used for mould making; moulding processes; bench moulding; floor moulding; Pit moulding and machine moulding; properties of moulding sand; their impact permeability; refractoriness; adhesiveness; properties of moulding sand; their impact and control of properties viz permeability; refractoriness adhesiveness;
cohesiveness; strength; flowability; collapsibility ;various types of moulding sand.

6. **Casting Processes**: Principles; working and applications of dies casting; hot chamber and cold chamber; centrifugal casting; special casting processes; principles, working and applications of; dies casting: hot chamber and cold chamber; centrifugal casting; different types of casting defects.

7. **Lathe**: Description and function of various parts of a lathe; classification and specification of various types of lathe; Work holding devices; Lathe operations; plain and step turning; facing; parting off; taper turning; lathe accessories; centers; dogs; chucks; collets; face plate; angle plate; mandrel; steady rest; taper turning attachment; tool post grind.

**TEXT BOOK**

**REFERENCE BOOKS**

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<tr>
<th>ME205D</th>
<th>MATERIALS AND METALLURGY</th>
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**OBJECTIVE**
Materials play an important role in the construction and manufacturing of equipment/tools. Right selection of materials adds to the economy, working and life of machinery. A diploma holder must be conversant with the properties, uses, availability and costs of materials used for construction/fabrication to enable him to perform his functions confidently. The subject of Materials and Metallurgy has been designed to cover the above aspects.

1. **Importance of Materials**: Classification; metals and non-metal; ferrous and non-ferrous metals and their alloys; names of common metals; their alloys and non-metals used in Industry; properties of metals and alloys; physical properties: appearance; luster; color; density and melting point; mechanical properties: strength; stiffness; elasticity; plasticity; toughness ;ductility; malleability; brittleness; hardness; fatigue and creep thermal and electrical conductivity Corrosion; causes effects and prevention.

2. **Metallurgical Considerations**: Solidification of metals form liquid to solid state of pure metals; cooling curves of pure metals; dendritic solidification ;crystal formation; types of crystal structure; phase diagram of (I) solid-state solubility (2) Partial solubility (3) Nil solubility i.e. eutectic solution ;(Binary
only); effects of all alloying elements on engineering materials; effect of grain size on mechanical properties.

3. **Ferrous Metals and Alloys**: Flow diagram for the production of ferrous metals from their ores; constituents of iron; iron carbon diagram; classification; composition and uses of cast iron and plain carbon steels. IS; BS and SAE grades; effect of alloying elements such as Aluminum; chromium; Nickel; Cobalt; Manganese; Molybdenum; tungsten; Vanadium; Silicon; Sulphur and Phosphorous on steels; composition; properties; grades and uses of special steels such as high speed steel; stainless steels; silicon steels; heat resistant steels; spring steel; heat treatment: iron-carbon diagram; objectives and practical aspects of heat treatment. Brief description and uses with examples of principal heat treatment processes; annealing; normalizing; tempering; hardening; carburising; nitriding and cyaniding and applications. Examples in heat-treating engineering components time; temperature transformation curve.

4. **Non-ferrous Metals and Alloys**: Copper: properties and uses; composition; properties and uses of copper alloys; brasses: cartridge brass; nickel silver; bronzes: phosphor bronze; Al-bronze; Mn-bronze; and gun metal. properties and uses of aluminium; composition; properties and uses of Al-alloys; e.g.; duralumin; Yellow metal; magnalium and hindalium; properties and uses of alloys of lead tin and magnesium; bearing metals: requisite qualities; composition; properties and uses of white metal bearing; copper based bearing metals. Aluminium based bearing metals.

5. **Identification and examination of Metal Alloys**: Identification tests; appearance; magnetic; spark; bend and microstructure; different types of etchants for preparation of surface structure.

6. **Other Important Materials**: Plastics: definition; classification of plastics; fibre glass; reinforced plastics; major applications of various plastics and their uses and grades; composite materials; heat insulating materials: properties and uses of asbestos; glass wool; rubber; felt; thermocole cork; mica; electrical insulating materials; properties and uses of china clay; leather; bakelite; ebonite; glass wool; rubber; felt; sound Insulating materials; Cork; fibre boards; fabrication materials; wood; plywood; rubber – natural and synthetic; glass – plate glass; toughened glass; safety glass; refractory materials: general characteristics and uses of dolomite; ceramics; Protective coating materials: paints; primers; varnishes; enamels; putti; electroplating material; rubasil; teflon coating; sealant and adhesives – application and availability of sealant and adhesives for industrial user.

7. **Selection; specifications and commercial availability of materials**: Practical considerations for selection of material for different purposes; ISO/Bureau of Indian standard specifications for metals; non-metals; various components and materials.

**TEXT BOOK**
Nut D.S."Materials and Matallurgy", S Kataria and Sons, Delhi
REFERENCE BOOKS
3. Rajput R.K. “Material Science”; SK Kataria and Sons; Delhi.

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<tr>
<th>ME206D</th>
<th>HYDRAULICS AND HYDRAULIC MACHINES</th>
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OBJECTIVE
Diploma holders in mechanical engineering are required to deal with problems of fluid flow and use of hydraulics in power generation. For this purpose; knowledge and skills about fluid mechanics; fluid flow and hydraulic machines are required to be imparted for enabling them to perform above functions. This subject aims at development of knowledge and skills about various properties of fluids; measurement of various flow parameters and about various hydraulic machines.

1. **Introduction**: Fluid; types of fluid; properties of fluid viz., mass density; weight density (specific weight); specific volume; capillarity; specific gravity; viscosity; compressibility.

2. **Pressure and its Measurement**: Concept of pressure (atmospheric pressure; gauge pressure absolute pressure; pressure measuring devices; peizometer tube; manometers - simple tube; differential single column; inverted U-tube; micro manometer bourdon pressure gauge simple problems.

3. **Flow of Fluids**: Types of fluid flow-steady and unsteady; uniform and non-uniform; laminar and turbulent; rate of flow and their units; continuity equation of flow; Bernoulli’s theorem without proof and its applications; discharge measurement with the help of venturi-meter; orifice meter and Pitot tube; simple problems.

4. **Flow through orifices**: Cc; Cv; Cd; flow through drowned and partially drowned orifices; time for emptying a tank through a circular orifice. simple problems.

5. **Flow through pipes**: Definition of pipe flow; wetted perimeter; hydraulic mean depth; hydraulic gradient; loss of head due to friction; Chezy’s equation and Darcy’s equation of head loss; loss of head in pipes due to sudden enlargement; sudden contraction; obstruction on flowpath; change of direction and pipe fittings; simple problems.

6. **Hydraulic Devices**: Description; operation and application of hydraulic machines; hydraulic ram; hydraulic jack; hydraulic brake; hydraulic accumulator; hydraulic door closer; hydraulic press.

7. **Water Turbines and Pumps**: Concept of a turbine; types of turbines; impulse and reaction; construction and working of pelton wheel; francis turbine and Kaplan turbine; concept of hydraulic pump; construction; working and operation of reciprocating pump and centrifugal pump.
TEXT BOOK

REFERENCE BOOKS

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<th>ME207D</th>
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OBJECTIVE
A Mechanical diploma holder can get employment in automobile manufacturing sector. He must have knowledge of constructional details of engine, its assembly and dismantling & other systems of different types of automobiles. He can also get employment in Power Plants and other Industries involving boilers and application of steam. So after studying this subject, he would be able to take up these assignments in various industries.

1. **Engines:** Introduction and classification of IC engine; working principle of two stroke and four stroke cycle; SI engines and CI engines; otto cycle; diesel cycle and dual cycle; location and functions of various parts of IC engines and materials used for them; concept of IC engine terms: bore; stroke; dead centre; crank throw; compression ratio; clearance volume; piston displacement and piston speed.

2. **Fuel Supply and Ignition System in Petrol Engine:** Concept of carburetion; air fuel ratio; simple carburetor and its application; working of solex and amal carburettor (line sketch) and its advantages over simple carburetor; description of battery coil and magneto ignition system; recent developments in fuel supply system-MPFI; electronic ignition system; increasing the efficiency by adopting super charging & turbo charging.

3. **Fuel System of Diesel Engine:** Component of fuel system; description and working of fuel feed pump; fuel injection pump; injectors.

4. **Cooling and Lubrications:** Function of cooling system in IC engine; Air cooling and water cooling system; use of thermostat; radiator and forced circulation in water cooling (description with line diagram);function of lubrication; types and properties of lubricant; lubrication system of IC engine

5. **Testing of IC Engines:** Engine power - Indicated and brake horse power; efficiency – mechanical thermal. relative and volumetric; methods of finding indicated and brake power; morse test for petrol engine; heat balance sheet; concept of pollutants in SI and CI engines; pollution control; norms for two or four wheelers - EURO - I; EURO -II; their Indian version; methods of reducing pollution in IC engines alternative fuels like - CNG; LPG.
6. Steam Turbines and Steam Condensers: Function and use of steam turbine; steam nozzles - types and applications; steam turbines - impulse; reaction; simple and compound; construction and working principle; governing of steam turbines; function of a steam condenser; elements of condensing plant; classification - jet condenser; surface condenser; condenser vacuum; vacuum efficiency; condenser efficiency; cooling pond and cooling towers.

7. Steam Power Plant: Main parts and working of power plant with simple line diagram; coal handling system; pulverized coal firing system; ash handling and disposal system; cooling towers; Use of feed water heater; economizer; air pre-heater; re-heating and regeneration and dust collector; heat balance and efficiency; classification; open cycle gas turbine and closed cycle gas turbines; comparison of gas turbines with reciprocating IC engines; applications and limitations of gas turbines: open cycle gas turbine and closed cycle gas turbines; comparison of gas turbines with reciprocating IC engines; steam power plant; main parts and working of power plant with simple line diagram; coal handling system; pulverized coal firing system; ash handling and disposal system; cooling towers; Use of feed water heater; economizer; air pre-heater; re-heating and regeneration and dust collector; principle of operation of ram-jet engine and turbo jet engine application of jet engines; rocket engine - its principle of working and applications; Fuels used in jet propulsion

TEXT BOOK

REFERENCE BOOKS

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<th>ME208D</th>
<th>WORKSHOP TECHNOLOGY-II</th>
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OBJECTIVE
Diploma holders are responsible for supervising production processes to achieve production targets and for optimal utilization of resources. For this purpose, knowledge about various machining processes, modern machining methods, processing of plastic, CNC machining, tool, jigs and fixtures is required to be imparted. Hence the subject of workshop technology.

1. Properties of Materials & Simple Stresses and Strains: Specification and working principle of milling machine; classification, brief description and applications of milling machines; details of column and knee type milling machine; milling machine accessories and attachment – arbors, adaptors, collets, vices; circular table, indexing head and tail stock, vertical milling attachment, spiral; milling attachment, slotting attachment and rack milling
attachment; milling methods - up milling and down milling; identification of different milling cutters and work mandrels; work holding devices; milling operations – face milling, angular milling, form milling, straddle milling and gang milling; cutting speed and feed, depth of cut.; indexing on dividing heads, plain and universal dividing heads; indexing methods: direct, plain or simple, compound differential and angular indexing cutting fluids used in milling.

2. **Grinding :purpose of grinding:** Specifications of grinding wheel – abrasive, grade, structure, bond common wheel shapes and types of wheel – built up wheels, mounted wheels and diamond wheels; specification of grinding wheels as per BIS. - truing, dressing, balancing and mounting of wheel grinding methods; surface grinding ;cylindrical grinding and centreless grinding; grinding machine; cylindrical grinder; surface grinder, Internal grinder, centreless grinder; tool and cutter grinder; selection of grinding wheel; cutting fluids used in grinding.

3. **Shaping Planing and Slotting:** Working principle of shaper, planer and slotter; quick return mechanism applied to shaper; slotter and planer machine; specification of shaper, planer and slotting machine; speeds, feeds and depth of cut.

4. **Broaching:** Introduction; types of broaching machines; single ram and duplex ram horizontal type, vertical type pull up, pull down, push down; elements of broach tool, broach teeth details nomenclature; types; tool material.

5. **Metal Forming Process:** Press working; press working – types of presses; types of dies; selection of press die; die material; press operations; shearing; piercing; trimming; punching; notching; shaving; gearing; embossing; stamping.

6. **Forging:** Open die forging ; closed die forging ;cold and hot forging; rolling; elementary theory of rolling ;types of rolling mills; rolling defects and remedies.

7. **Extrusion and Drawing:** Type of extrusion- hot and cold, Direct and Indirect; Pipe drawing; tube drawing.

**TEXT BOOK**

**REFERENCE BOOKS**
1. Raghuwanshi B.S." Workshop Technology", Dhanpat Rai and Sons, Delhi
OBJECTIVE
A diploma holder in this course is required to assist in the design and development of prototype and other equipments. For this, it is essential, that he is made conversant with the principles related to design of components and application of these principles for designing and prepare drawing of the same and hence this subject.

1. **Introduction**: Design; definition; types of designs necessity of design; comparison of designed and undersigned work ;design procedure; practical examples related with design procedure; characteristics of a good designe; characteristics of environment required for a designer ;design terminology: stress, strain, factor of safety, factors affecting factor of safety, stress concentration, methods to reduce stress ; concentration, fatigue, endurance limit; general design considerations; codes and standards.

2. **Design of keys and shafts**: Design of keys; types of keys; materials of keys, and functions of keys, design of keys; design of shafts: types of shaft, type of loading on shafts, shaft materials, effect of keyway on shaft strength, design of shafts under various loading.

3. **Design OF Shafts: Types of joints**: Temporary and permanent, utility of joints; permanent joints. welded joints types of welded joints, strength of parallel and transverse fillet welds ; strength of combined parallel and transverse welds; Axially loaded welded joints; riveted joints: rivet materials, rivet heads; leak proofing of riveted joints; caulking and fullering; different modes of rivet joint failure; design of riveted joints: lap, butt, diamond (Lozenzo); design of boiler joints i.e. circumferential and longitudinal boiler joints.

4. **Design of Couplings**: Necessity of a coupling, advantages of a coupling and types of couplings, design of flanged couplings.

5. **Assembly** Drawing of the following: Tool post; bench-vice; safety valve.

6. **Cams**: cam profile nomenclature; types of followers; motions of follower; to draw cams with different followers with different motions.

7. **Gears**: Types of gears; nomenclature of gears; conventional representation of gears, draw profile of spar gear.

**TEXT BOOK**

**REFERRENCE BOOKS**

<table>
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<th>ME251D</th>
<th>STRENGTH OF MATERIALS LAB</th>
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**LIST OF EXPERIMENTS**

1. Tensile test on bars of mild steel and aluminium.
2. Compression test on block of mild steel and aluminium.
3. Shear test on specimen of two different metals.
4. Binding test on flat of mild steel and aluminium.
5. Impact test on metals Izod test
7. Torsion test on specimens of different metals for determining the angle of twist for a given torque.
8. To determine the stiffness of a helical spring and to plot a graph between load and extension.
9. Hardness test on metal and finding the Rockwell hardness
10.Hardness test on metal and finding the Brinel hardness number.

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**LIST OF EXPERIMENTS**

1. To find out the dryness fraction of steam by throttling calorimeter.
2. Determination of calorific value of fuel by bomb calorimeter.
3. To find out specific fuel consumption by gravimetric or volumetric fuel equipment.
4. To find out the viscosity index of lubricant by Orsat Apparatus.
5. To find out CO2 value of exhaust from engine by CO2 recorder (smokemeter).
6. To study the construction and working of single stage air compressor.
7. To find out the flash point of fuel by flash point apparatus.
8. Study of various fire tube and water tube boiler by models or by visits.
9. Study of various mounting of boilers.
10. Study of various accessories of boilers.

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**LIST OF EXPERIMENTS**

1. WELDING : Making following types of joints by gas welding- preliminary joining practice; vertical welding; exercises of gas welding on the following: aluminium; brass; copper; C.I., gas cutting of the following types, preliminary gas cutting practice; dock cutting by oxy acetylene; CI cutting; making following types of joints by arc welding on M.S, C.I and aluminium; joining practice by arc welding;
butt and lap joint (in vertical position, travel up and down); welding of outside corner joint; Inspection of the welding defects occurred in the job; exercise on spot welding; exercise on projection welding (industrial visit should be arranged); exercise on TIG welding; exercise on MIG welding; exercise on brazing.

2. **FOUNDRY**: Preparation of the following types of moulds; floor molding; moulding and casting of a solid pattern; a split pattern; testing and inspection of casting defects visually; study of constructional features of cupola furnace.

3. **TURNING**: Simple exercise on turning and step turning; a composite job involving turning, taper turning, thread cutting and knurling and eccentric turning; exercise on internal threading on lathe.

4. **DRILLING AND FITTING**: Marking and drilling practice using column and knee type drilling machine and radial drilling machine; a job on drilling, threading; reaming; counter boring and counter sinking; exercise on boring with the help of boring bar; dovetail fitting in mild steel piece; radius fitting in mild steel piece; exercise on pipe bending on MS pipe and PVC pipe using pipe bending machine.

5. **PATTERN MAKING**: Preparation of solid pattern (single piece); preparation of split pattern; preparation of self cored pattern.

**NOTE:**
1. The workshop Superintend will prepare and finalize the specific drawings of all jobs in the beginning of semester in consultation with staff.
2. The Institutions where foundry shop is not existing they should arrange a visit to foundry industry in the near by area.

**REFERENCE BOOK**


**LIST OF EXPERIMENTS**

1. **Introduction**: Limits and fits; limit system; tolerance; limits; deviation; allowance; basic size; design size; tolerances; fundamental tolerances; fundamental deviation; method of placing limit dimensions; fits: clearance fit; transition fit; interference fit; hole basis system; shaft basis system; tolerance grades; calculating values of clearance/interference; hole tolerance and shaft tolerance with given basic size for common assemblies like H7/g6, H7/m6, H8/u7.

2. **Surface Roughness**: Introduction-actual profile; reference profile; datum profile; mean profile, peak to valley height, mean roughness index, surface roughness number; use of machining symbols in production drawings; Indication of surface roughness; indication of special surface rough
characteristics ; Indication of machining allowance; Indication of surface roughness; symbols on drawings; method of indicating surface roughness on given components.
3. **Shaft Coupling**: Oldham coupling; universal coupling.
4. **Bearings**: Bush bearing; foot step bearing; plummer block; self aligning bearing; brackets.
5. **Pipe Joints**: Symbols for piping and layout plan of piping; flanged joint; Socket and spigot joint; union joint; expansion pipe joint.
7. **Screw Jack**

**REFERENCE BOOKS**

**NOTES:**
1. A minimum of 10 drawing sheets are to be made.
2. The drawings should include dimensions with tolerances, where ever necessary and material list according to B.I.S Specifications as per SP46: 1988.
3. 25% of the drawing sheets should be drawn using AutoCAD.

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<th>ME255D</th>
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**LIST OF EXPERIMENTS**
1. Classification of about 25 specimen of materials/parts in material lab; identify and indicate the type of materials with respect to their properties.
2. Study of metallurgical microscope.
3. To prepare microscopic structure for examination and to examine the micro structure of specimens of various metals.
4. To prepare microscopic structure for examination and to examine the micro structure of specimens of various alloy.
5. Study of heat treatment furnaces.
6. To study the effects of heat treatments processes on the materials low carbon steel.
7. To study the effects of heat treatments processes on the mild steel.
8. To study the effects of heat treatments processes on the high carbon steel.
9. Write ISO/Bureau of Indian standard specifications for metals and non-metals.
10. Write ISO/Bureau of Indian standard specifications for various components and materials.

**REFERENCE BOOKS**
LIST OF EXPERIMENTS
2. To find out the value of coefficient of discharge for a venturimeter.
4. Verification of Bernoulli’s theorem.
5. To determine the coefficient of friction of pipe using Darcy’s equation.
6. Study the working of a Pelton wheel.
7. Study the working of a Francis turbine.
8. Study the working of a Kaplan turbine.
9. Dismantling and assembly of a reciprocating pump to study its constructional details; operation including fault diagnosis.
10. Dismantling and assembly of a single stage centrifugal pump to study its constructional details; operation including fault diagnosis.

REFERENCE BOOK

LIST OF EXPERIMENTS
1. Dismantle a two stroke engine; note the function and material of each part; reassemble the engine.
2. Dismantle a single cylinder diesel engine. Note the function of each part; reassemble the engine.
3. Dismantle Solex; Amal carburetor; locate; and note down the functions of various parts; re-assemble.
4. Study of battery ignition system of a multi-cylinder petrol engine stressing ignition timings; setting; fixing order and contact breaker; gap adjustment.
5. Study of lubricating system of IC engine.
6. Determination of BHP by dynamometer.
7. Morse test on multi-cylinder petrol engine.
8. To prepare heat balance sheet for diesel/petrol engine.
9. Local visit to roadways or private automobile workshops.
10. Study of steam turbines through models and visit.
11. Study of steam condensers through model and visits.
12. Performance test of engine by full throttle and part throttle.
REFERENCE BOOK

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<th>ME258D</th>
<th>WORKSHOP PRACTICE – II LAB</th>
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LIST OF EXPERIMENTS

1. Produce a rectangular block by face milling and prepare a slot on one face with a slotting cutter / side and face cutter.
2. Gear manufacturing by some indexing device on a milling machine & gear hobber. Inspection of gear.
3. Job on grinding using- Surface grinding; Cylindrical grinding; Centreless grinding.
4. Milling cutter grinding on tool and cutter grinder.
5. Prepare a V-block to ± 0.2 mm accuracy on shaper machine.
6. Exercise on key way cutting and spline cutting.
7. Preparation of job through eccentric turning.
8. Make a funnel of GI sheet.
9. Practice of taper turning.
10. Exercise on EDM for preparation of electrodes (male and female).

REFERENCE BOOKS

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<th>PD291D</th>
<th>CO-CURRICULAR</th>
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OBJECTIVE
To help the students in their all round growth and acquire attributes like team spirit, organizational ability, leadership qualities, etc.

OPERATION
The students are to take part in Co-curricular activities outside contact hours through clubs/ societies spread over all the three terms of the year. They are required to register for this course in each term and their performance will be evaluated in last term of the year

<table>
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<tr>
<th>PD292D</th>
<th>ENTREPRENEURSHIP AND PROFESSIONAL SKILLS (MLC)</th>
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OBJECTIVE
To equip the students with the understanding of human behavior, develop time management skills, and enhance personality.
1. **Transactional Analysis**: Winners & losers; ego states; OK states; positive & negative strokes; life scripts; exercises.

2. **Self Discovery**: Importance of knowing yourself; SWOT analysis; benefits; strengths and weaknesses; exercises.

3. **Time Management**: Features; time management matrix; tips for time management; effective scheduling; time wasters; time savers; exercises and time bound tasks.

4. **Stress Management**: What is stress; causes; positive & negative stress; effects; signs; tips to overcome stress; stress busters; exercises.

5. **Decision Making**: Definition; models & types; skills and techniques; courses of action; steps involved in decision making; Individual decision making & group decision making; exercises.

6. **Group Discussions**: Meaning of a GD; types; role of a moderator; Do's and Don'ts; mock GDs - general knowledge based and abstract topics.

7. **Entrepreneurial Skills**: Meaning; entrepreneurial competencies; advantages; risks involved; avenues & opportunities; support from Govt.; basic and significant personality traits; venture project planning and entrepreneurship cycles; planning the project; entrepreneurship in daily life; case studies in entrepreneurship; exercises.

**Reference Books**

2. Harris, Thomas Anthony ,“I’m OK; You’re OK”, Galahad Books, 2004