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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" CAU/AUC 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
  (iiv) Professional Courses
  (iiiiv) 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.

<table>
<thead>
<tr>
<th>LETTER-GRAGE</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>
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<tr>
<td>DD</td>
<td>4</td>
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<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
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>
</tr>
</thead>
<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.
- 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:**
\[
SGPA = \frac{\sum C_i G_i}{\sum C_i}
\]
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:**
\[
CGPA = \frac{\sum C_i G_i}{\sum C_i}
\]
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:
  (a) 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.
Diploma/B.Tech Engineering Programme

** 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 Computer Science
#### 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>CS201D</td>
<td>Operating System</td>
<td>3-0-0</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>CS202D</td>
<td>Data Structure Using C</td>
<td>3-0-0</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>CS203D</td>
<td>Data Communication</td>
<td>3-0-0</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>EC201D</td>
<td>Digital Electronics – I</td>
<td>4-0-0</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>EC202D</td>
<td>Microprocessors – 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>CS251D</td>
<td>Operating System Lab</td>
<td>0-0-2</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>CS252D</td>
<td>Data Structure Using C Lab</td>
<td>0-0-4</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>CS254D</td>
<td>Computer Workshop</td>
<td>0-0-4</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>EC251D</td>
<td>Digital Electronics – I Lab</td>
<td>0-0-4</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>EC252D</td>
<td>Microprocessors – I Lab</td>
<td>0-0-2</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>PD191D</td>
<td>Co-curricular Activities</td>
<td></td>
<td>1*</td>
</tr>
</tbody>
</table>

### TOTAL CONTACT HOURS | TOTAL CREDITS
| 16-0-16(32) | 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-II through Co-Curricular Activities outside contact hours. However, a student is to register for this course in both the Semesters of the year.
### Scheme of Studies
**Diploma/B.Tech.(Integrated)in Computer Science**

#### Semester-IV

<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>CS205D</td>
<td>Object Oriented Programming using C++</td>
<td>3-0-0</td>
<td>3</td>
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<tr>
<td>2</td>
<td>CS206D</td>
<td>Windows and Linux Operation System</td>
<td>2-0-0</td>
<td>2</td>
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<tr>
<td>3</td>
<td>CS207D</td>
<td>Relational Database Management System (RDBMS)</td>
<td>2-0-0</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>CS208D</td>
<td>Multimedia Applications</td>
<td>2-0-0</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>CS209D</td>
<td>Computer Organization</td>
<td>3-0-0</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>CS210D</td>
<td>Computer Peripherals and interfacing</td>
<td>3-0-0</td>
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<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>CS255D</td>
<td>Object Oriented Programming Lab</td>
<td>0-0-4</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>CS256D</td>
<td>Windows and Linux Operation System Lab</td>
<td>0-0-4</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>CS257D</td>
<td>Relational Database Management System Lab</td>
<td>0-0-4</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>CS258D</td>
<td>Multimedia Lab</td>
<td>0-0-2</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>CS260D</td>
<td>Computer Peripherals and interfacing Devices 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**  
15-0-18(33)  

**TOTAL CREDITS**  
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-II 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. 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.
   c. One or more than one experiments/programs may be performed in one lab period in order to utilize the time properly.
   d. 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.
DETAILED SYLLABUS
(Diploma/B.Tech.(Integrated) in Computer Science)

<table>
<thead>
<tr>
<th>CS201D</th>
<th>OPERATING SYSTEM</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 course provides the students with an understanding of human computer interface existing in computer system and the basic concepts of operating system and its working. The students will also get hand-on experience and good working knowledge to work in DOS and windows environments. The aim is to gain proficiency in using various operating systems after undergoing this course. While imparting instructions, the teachers are expected to lay more emphasis on concepts and principles of operating systems, its features and practical utility.

1. **Brief Introduction to System Software**: Compiler; Assembler; Loader; Operating system
2. **Brief Introduction to MS-DOS and WINDOWS**: Brief history of DOS and WINDOWS; main features of DOS; Directory structure of DOS; file structure of DOS; detail concept of DOS commands; Introduction to Windows
3. **Overview of Operating System**: Definition of Operating Systems; types of Operating Systems; Importance of Operating Systems; software organization; Linking; loading and executing control program.
4. **Functions of Operating System**: Process management functions (Principles and brief Concept); job scheduler; process scheduler; process synchronization
5. **Memory Management Function (Principles and Brief Concept)**: Introduction single process system; Fixed Partition Memory; system loading; segmentation; Swapping; simple paging system.
6. **I/O Management Functions (Principles and Brief Concept)**: dedicated devices; shared devices; I/O devices; storage devices; buffering; spotting.
7. **File Management**: Principles and brief concept; types of file system; simple file system; basic file system; logical file system; physical file system.

**TEXT BOOK**

**REFERENCE BOOKS**
OBJECTIVE
Data structures are the techniques of designing the basic algorithms for real-life projects. Understanding of data structures is essential and this facilitates the understanding of the language. The practice and assimilation of data structure techniques is essential for programming. The knowledge of ‘C’ language and data structures will be reinforced by practical exercises during the course of study. The course will help students to develop the capability of selecting a particular data structure.

1. **Fundamental Notations:** Problem solving concept, top down and bottom up design; structured programming; Concept of data types, variables and constants, concept of pointer variables and constants.
2. **Arrays:** Concept of Arrays; Single dimensional array; Two dimensional array; Operations on arrays with Algorithms (searching, traversing, inserting, deleting).
3. **Linked List:** Introduction to linked list and double linked list; representation of linked lists in Memory, traversing a linked list; Searching linked list; Insertion and deletion into linked list; application of linked lists, Doubly linked lists; traversing a doubly linked lists; Insertion and deletion into doubly linked lists.
4. **Stacks, Queues and Recursion:** Introduction to stacks; representation of stacks, implementation of stacks; uses of stacks; introduction to queues; Implementation of queues (with algorithm); circular Queues; De-queues.
5. **Trees:** Concept of Trees; Concept of representation of Binary Tree; Traversing Binary Trees (Pre order, Post order and In order); searching; inserting and deleting binary search trees.
6. **Sorting:** Concept of sorting; Sorting algorithms (Bubble Sort; Insertion Sort, Quick Sort; selection Sort, Merge Sort; Radix Sort; Heap Sort; Radix Exchange Sort).
7. **Searching:** Introduction; Search algorithm (Linear and Binary).

**TEXT BOOK**

**REFERENCE BOOKS**
OBJECTIVE
Data communication course is intended to provide practical exposure and awareness of existing and upcoming communication technologies. The course is designed in conjunction with the course “Computer Networks” which provides concepts of networks.

1. **Methodology**: Need for a modulation in communication systems.; Concept of AM, FM, PM, PAM, FSK. PSK and PCM (no mathematical treatment); Concept of bandwidth; noise and channel capacity.

2. **Data Communication Principles**: Transmission of binary data, concept of simplex; half duplex and full duplex modes; two and four line systems; Byte level data communication; synchronous communication data transfer efficiency; synchronous communication; start-stop bits, data transfer efficiency, relative advantage and disadvantage with synchronous communication; Frame level communication.

3. **Data Packets and transmission**: Data packets; address encoding and decoding of data packets; data encryption and decryption; Serial and parallel data communication; comparison in terms of speed of data transfer; synchronous transmission; synchronous transmission.

4. **Error Detecting**: Source of errors in data communications; effects of errors, data error rate and its dependency on data transfer rates; Error detecting through parity bit; block parity to detect double errors and correct single error ; Characteristics of white noise and digital noise.

5. **Communicating Methods and Standards**: One to one connections; multi drop lines; method of implementation; channel capacity ;multiplexed lines, time division multiplexing and demultiplexing.

6. **Concept of Synchronization**: Synchronization method; direct mode of communication; need for handshake mode of communication; handshake modes.

7. **Applications of data communications**: different communication system such as radio; microwave, different types of electrical communication lines; optical fiber system and issues like line characteristics and impedance matching.

**TEXT BOOK**

**REFERENCE BOOK**
OBJECTIVE
Object orientation is a new approach to understand the complexities of the real world. In contrast to the earlier approaches like procedural etc, object orientation helps to formulate the problems in a better way giving high reliability, adaptability and extensibility to the applications. The students are already familiar with this concept of programming in C which is the basic for C++. This course offers the modern programming language C++ that shall help the students to implement the various concept of object orientation practically. The students will be able to programmed in the object oriented technology with the usage of C++.

1. Introduction and Features: Fundamentals of object oriented programming – procedure oriented programming Vs. object oriented programming (OOP); Object oriented programming concepts – Classes, reusability; encapsulation, inheritance; polymorphism; dynamic binding; message passing.

2. Language Constructs: Review of constructs of C used in C++ : variables; types and type declarations; user defined data types; increment and decrement operators; relational and logical operators; if then else clause; conditional expressions; input and output statement; loops; switch case; arrays; structure; unions; functions pointers; preprocessor directives.

3. Classes and Objects: Creation; accessing class members; Private Vs Public; constructor and destructor; objects.

4. Member Functions: Method definition; Inline Implementation; constant member functions; overloading member functions; need of operator overloading; prefix and postfix; overloading binary operators; operator overloading; instream/ outstream operator overloading.

5. Inheritance: Definition of inheritance; protected data, private data; public data, inheriting constructors and destructors; constructor for virtual base classes; constructors and destructors of derived classes; and virtual functions; size of a derived class; order of invocation, types of inheritance, single inheritance; hierarchical inheritance; multiple inheritance; hybrid inheritance.

6. Polymorphism and Virtual Functions: Importance of virtual function; function call binding; virtual functions; implementing late binding; need for virtual functions; abstract base classes and pure virtual functions, virtual destructors.

7. File and Streams: Components of a file; different operation of the file; communication in files; creation of file streams; stream classes, header files, updating of file, opening and closing a file; file pointers and their manipulations; functions manipulation of file pointers; detecting end-of-file.
TEXT BOOK

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>CS206D</th>
<th>WINDOWS AND LINUX OPERATING SYSTEM</th>
<th>L-T-P</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2-0-0</td>
<td>2</td>
</tr>
</tbody>
</table>

OBJECTIVE
The knowledge of this subject will enable the students to understand the concepts of Linux and its potential. The students will also get hand on experience of linux after undergoing this course.

1. **Linux Operating System**: Introduction; History of Linux and Unix; Linux overview; linux releases, open linux.
2. **Linux Commands and Filters**: Mkdir; CD; rmdir; pwd; ls; who; whoami; cat, more, fail, head, concept of, mv, chmod, grep, wc, comm., split, sort, diff, kill, write, wall, merge, mail, news.
3. **Shell**: The command line special characters and file arguments; standard input/output and redirection, pipes; redirecting and piping with standard errors; shell scripts, jobs.
4. **Linux file Structure**: Linux files; file structure, listing displaying and printing files; managing directories; file and directory operations.
5. **Vi Editor**: Vi editing commands; advanced Vi editing commands; line editing commands; options in Vi.
6. **System Administration**: System management; managing users; installing and managing devices; floppy disk management; file system administration; backup.
7. **Windows Network Operating System**: Introduction, Windows operating system - its features and capabilities; comparison with OS hardware, requirements for Windows 98, 2000 XP, Millennium, NT. Control Program and Control Panel; customizing desktop, installing, removing programs, managing your files and folders, (creating, renaming, deleting, moving, copying etc.)

TEXT BOOK
REFERENCE BOOKS

<table>
<thead>
<tr>
<th>CS207D</th>
<th>RELATIONAL DATABASE MANAGEMENT SYSTEM</th>
<th>L-T-P</th>
<th>Cr</th>
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<tbody>
<tr>
<td></td>
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<td>2-0-0</td>
<td>2</td>
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</tbody>
</table>

OBJECTIVE
Database and database systems have become an essential component of everyday life in modern society. This course will acquaint the students with the knowledge of fundamental concepts of DBMS and its application in different areas, storage, manipulation and retrieval of data using query languages.
1. **Introduction:** Database Systems, Database and its purpose; characteristics of the database approach, Advantages and disadvantages of database systems; classification of DBMS Users, actors on the scene, Database Administrators, database designers, end users; system analysts and application programmers, workers behind the scene (DBMS system designers and implementers, tool developers, operator and maintenance personnel).
2. **Database System Concepts and Architecture:** Data models, schemas, instances, data base state, DBMS Architecture, The External level, The conceptual level, The internal level; mappings; Data Independence, Logical data Independence, Physical data Independence, Database Languages and Interfaces, DBMS language, DBMS Interfaces; classification of database management Systems.
3. **Data Modeling using E.R. Model (Entity Relationship Mode):** Data models classification : file based or primitive models, traditional data, models, semantic data models. Entities and Attributes, Entity types and Entity sets, Key attribute and domain of attributes, Relationship among entities
4. **Relational Model:** Relational Model Concepts: Domain, Attributes, Tuples and Relations, Relational constraints and relational database schemes, - Domain constraints, Key constraints and constraints on Null Relational databases and relational database schemes, Entity integrity, referential integrity and foreign key.
5. **Functional Dependencies and Normalization:** Functional dependencies, Trivial and Non-trivial dependencies, Closure of a set of dependencies and attributes, Irreducible set of dependencies.
6. **Normalization:** Non-loss decomposition and functional dependencies, First, Second and Third normal forms, Boyce/ Codd normal form.
7. **Structured Query Language:** Data definition language : Create, Alter, Drop commands, Data Manipulation Language (DML), Select command with where clause using conditional expressions and Boolean operators, group by clause, like operator, Insert, Update and Delete commands.
TEXT BOOK

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>CS208D</th>
<th>MULTIMEDIA APPLICATION</th>
<th>L-T-P</th>
<th>Cr</th>
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<td>2</td>
</tr>
</tbody>
</table>

OBJECTIVE
Multimedia is a new concept emerged in the recent times. Now this technology is being widely used in web pages, motion pictures and interactive presentations, animation etc. Multimedia has made a significant impact in training/education, business presentations, public information access etc. This course intends to introduce and expose multimedia technology and various factors and features of authoring software. It will also help in making the internet application richer in content and presentation.

1. **Introduction**: Introduction to multimedia, hypertext, hypergraphics, animation, application in education and training, science and technology, kiosks, business and games.
2. **Multimedia Hardware**: Multimedia PC configuration, features and specifications of sound and video interfaces, OCR, touch-screen, scanners, digital cameras, speakers, printers, plotters, optical disks and drives as CDROM and DVD. multimedia networks.
3. **Multimedia Files**: Image and sound file formats, multimedia file formats, compression, standards and techniques, features of software to read and write such files.
4. **Photo-shop**: Photo-shop workshop, image editing tools, specifying and adjusting colors, using gradient tools, selection and move tools, transforming path drawing and editing tools, using channels, layers, filters and actions.
5. **Flash**: Exploring interface, using selection and pen tools, working with drawing and painting tools, applying color, viewing and manipulating time line, time line/stage relationship, animating (frame-by-frame, tweening), guiding layers, importing and editing sound and video clips in flash, working with 3-D graphics.
6. **Director**: Exploring interface: score editor, cast editor, toolbars, library, palette, inspector, menu bar, cast libraries, painting techniques, importing
images, working with stage, sprites and score; using text, using sound, using
digital video, creating behaviour, using behaviour inspector, basics of lingo.
7. Multimedia Database: Image data; audio data, video data; spatial data,
temporal data; content based image retrieval and video retrieval.

TEXT BOOK
1. Villam Casanova and Molina, "Multimedia An Introduction by"; Prentice Hall of
   India, New Delhi. 3rd edition, 2007

REFERENCE BOOKS
3. Feudnon, "Mastering Macro Media Director 5"; BPB Publication, New Delhi,
   New Delhi, 3rd 2001.

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<tr>
<th>CS209D</th>
<th>COMPUTER ORGANISATION</th>
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OBJECTIVE
This course aims to develop knowledge and skills in the subject of organization of
components of a computer. The course will enable the students to be familiar with
computer hardware, standards, instruction set and assembly language
programming. It deals with the architecture of major components of a computer
and functioning of these different components.
1. Introduction to Computer Organization: Structure and Function:
   Introduction to components, functions of individual component with block
diagram, Introduction to machine language, assembly language, assembler,
   compiler, interpreter, What is BIOS, Functions of BIOS.
2. System Buses and Expansion Buses: Introduction, system buses in PCs,
   expansion buses in PCs, ISA, EISA, VESA, PCI.
3. Processor: Introduction, role of processor in a PC, working of processor with
   the help of a block diagram. processors generations and processor families,
   inside a processor, processor packaging, processor sockets. Processor
   Instruction Sets - RISC Technology, different RISC processors available,
difference between RISC and CISC processors.
4. Input-output Organization: Peripheral devices, input/output interface,
synchronous vs asynchronous data transfer, Direct Memory Access(DMA),
priority interrupt, Input-output processor data communication processor.
5. Memory Organization: Introduction to main memory, secondary memory,
cache memory, physical vs. virtual memory, associate memory, memory
management unit, memory mapping, paging and page replacement polices.
6. Introduction to Multi-Processor System: Parallel processing and pipelines,
   basic characteristics of multiprocessor, multi- processor organization (time
   shared bus, multiport, central control unit).
Diploma/B.Tech Engineering Programme

7. **Vector Processor**: Vector processing, Array Processing, advantages of vector processing.

**TEXT BOOK**

**REFERENCE BOOKS**

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<th>CS210D</th>
<th>COMPUTER PERIPHERALS AND INTERFACING DEVICES</th>
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**OBJECTIVE**
A computer engineer should be able to interface and maintain key-board, printer, mouse monitor etc. along with the computer system. The course provides the necessary knowledge and skills regarding working construction and interfacing aspects of peripherals. The students will get to know how various peripherals communicate with central processing unit of the computer system and pattern their respective operations. The student will be able to maintain keyboard, printer, monitors and Power Supplies (CVTs and UPSs) along with computer system. This subject provide the required background of computer installation, maintenance and testing of peripheral with micro computers. So a course on Computer Peripherals and Interfacing Devices is required to develop such skills.

1. **Video Display**: The basic principle of working of video monitors, video display adaptors, video Modes, Video display EGA/VGA/SVGA/PCI adapters and their architecture, Overview of Raster scan, vector graphic, their main difference and relative advantages, Concept of reduction and bandwidth of monitors refreshing of screen.
2. **Key Board and Mouse**: Basic principle of working of key board and mouse, digitizers, joystick, tablets, touch screen, scanner, scan codes.
3. **Other Devices**: Constructional features and working of hard disk drive, floppy disk drive, optical and DVD disk drive. Logical structure of disk and its organization, boot record, and CD writer.
5. **Software aspects of peripheral devices**: Role of device drivers, DOS and Unix device drivers.
6. **Power Supplies**: SMPS used in computers and constant voltage transformers, On Line/Off Line uninterrupted power supplies (UPS), basic principle of working their importance and maintenance.

7. **The BIOS and DOS Services**: The basic idea of BIOS and DOS services for diskette, serial port key board and printers, future trends: Various types of digital buses. Analysis of recent progress in peripheral and bus systems, Some aspects of cost performance analysis while designing the system

**TEXT BOOK**

**REFERENCE BOOKS**

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<thead>
<tr>
<th>CS251D</th>
<th>OPERATING SYSTEM LAB</th>
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**LIST OF PRACTICLALS**
1. Practical exercises involving various internal commands (20 No.).
2. Practical exercises involving various external commands (20 No.s)
3. To create current directory path, to change directory, to create new directory, to remove an existing directory etc.
4. Creating Batch file and its usage in M.S.DOS.
5. Demonstration of all the controls provided on Control Panel.
7. Practical exercises involving Basics of Windows (20 No.).
8. Creating an user account etc.
9. Concept of Virtual memory.
10. Increasing /decreasing of virtual memory and its effect in performance of operating system.

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<th>CS252D</th>
<th>DATA STRUCTURE LAB</th>
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**LIST OF PRACTICALS**
1. Write programmes in C to implement selection (exchange) sort techniques.
2. The bubble sort technique.
3. The quick sort technique.
4. The merge sort technique.
5. The binary search procedures to search an element in a given list.
6. The linear search procedures to search an element in a given list.
7. The addition of two matrices using functions.
8. The multiplication of two matrices using pointers.
10. Insertion and Deletion of elements in queue using pointers.

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<th>CS254D</th>
<th>COMPUTER WORKSHOP</th>
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**OBJECTIVE**
The course aims at making the students familiar with various parts of computers and how to assemble them, and different types of peripherals desired. In addition, the course will provide the students with necessary knowledge and skills in computer software installation and maintenance to make him diagnose software faults.

1. Familiarization with various components and parts of personal computers, motherboard details, hard disk and hard disk drive, floppy disk drive.
2. CD Rom drive, DVD, keyboard, display devices, various chips (memory chips and CPU).
3. Serial and parallel ports, assembly of complete PC making it operational, fault finding. Fault diagnosis, repair and maintenance of inkjet.
4. Dot matrix and Laser printers, Use of Modems.
5. Assembly and Dissembling of PCs: Power supply, linear power supply and switch mode power supply, trouble shooting of SMPS.
6. Loading of various operating system, LINUX, windows NT, Windows 95 and 98.
7. Familiarization of their features with practical demonstrations. Changing settings on Widows 2000, XP.
8. Loading other software like MS-Office, Visual Basic, Page Maker, Corel Draw, AutoCAD etc.
9. Virus detection, prevention and cure. Use of PC tools. Learning various types of virus such as polymorph virus, stealth viruses; boot sector virus, file virus, partition table viruses.
10. Structure of floppy disk and hard disk, writing to boot sector and reading from it.

**TEXT BOOK**

**REFERENCE BOOKS**
LIST OF PRACTICALS
1. Write a function using variables as arguments to swap the values of a pair of integers. An election is contested by five candidates. The candidates are numbered 1 to 5 & voting is done by marking the candidate number on the ballot paper. Write a program to read the ballot & count the votes cast for each candidate using an array, variable count. In case, a number read is out side the range 1 to 5, the ballot should be considered as a 'spoilt ballot' and the program should also count the number of spoilt ballot.
2. Write a program to read a matrix of size m*n from the keyboard and display the same on the screen.
3. Write a macro that obtain the largest of three number.
4. As the practical 4, using inline function. Test the function using the main program.
5. Define a class to represent a bank account including the following members:-
   - Data members
     a) Name of the depositors
     b) Account number
     c) Type of account
     d) Balance amount in the account
   - Member function
     - To assign initial values
     - To deposit an amount
     - To withdraw an amount after checking the balance
     - To display the name and balance
6. Modify the class and the program of practical 6 for handling 10 customers. Create 2 classes OM and DB which store the value of distance. DM store distances in meters and cm and DB in feet and inches. Write a program that can read values for the class objects and add 1 object OM with another object of DB.
7. Use a friend function to carry out the addition operation the object that stores the results may be a DM object or a DB object, depending upon the units in which the results are require. The display should be in the format of feet and inches or meters and cms depending on the object on display.
8. A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title and publisher and stock position. Whenever a customer wants the book, the sales person inputs the title and author and the system search the list and display whether it is available or not. If it is not, a appropriate message is displayed, if it is, then the system displays the book details and requests for the number of copies require. If the requested are available, the total cost of the required copies is displayed: otherwise the message "Required copies not in stock" is displayed. Design a system using a class called books with suitable member functions and
constructors. Use new operator in constructor to allocate memory space require.

9. Define a class string that could work as a user defined string type include constructors that will enable us to create an un-initialized string String s1; string with length 0. And also to initialize an object with string constant at the time of creation like String s2("well done"). Include a function that adds two strings to make a third string.

10. Exercise on File Handling.

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<tr>
<th>CS256D</th>
<th>WINDOWS AND LINUX OPERATING SYSTEM LAB.</th>
<th>L-T-P</th>
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LIST OF PRACTICALS
1. Installing Linux.
2. Creating and managing user accounts.
3. Practice on Linux commands.
4. Practice on vi commands.
5. Write and execute programmes in Linux using shells to find out
   - Factorial of numbers
   - Even/odd numbers.
6. Write and execute programmes in Linux using shells to calculate
   - Fibonacci series
   - Prime numbers
7. Write and execute programmes in Linux using shells to calculate
   - Arrange of numbers
   - Reverse of numbers
8. Write and execute programmes in Linux using shells to calculate
   - Lower case to upper case
   - Greatest of three numbers etc.
9. Installing and configuring X-windows;
   Create file and folder, Searching a file
10. Installation of device drivers: Creating user accounts, Customizing desktop, Setting monitor resolution.

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<tr>
<th>CS257D</th>
<th>Relational Database Management System Lab.</th>
<th>L-T-P</th>
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LIST OF PRACTICALS
1. Overview, Features and functionality, Application development in MS-Access.
2. Exercises on different forms of select statement, altering and dropping of tables.
3. Exercises on creation of tables.
4. Exercises on insertion of data into tables.
5. Exercises on deletion of data using different conditions.
7. Create any application using Procedure.
8. Create any application using Trigger.
9. Study of various types of Join operation.
10. Study of View and Indices.

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<th>CS258D</th>
<th>MULTIMEDIA LAB</th>
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LIST OF PRACTICALS
1. Configuring multimedia devices to PC (Personal computer).
2. Installing and use of multimedia devices like: Scanner.
4. Installing and use of multimedia devices like: Mike and speakers, Touch screen.
5. Installing and use of multimedia devices like: Plotter and printers, DVD, Audio CD and Video CD, Reading and writing of different format on a frame CD.
6. Transporting audio and video files.
7. Using various features of Director.
8. Using various features of Flash.
9. Using various features of Photo-shop.
10. Making multimedia presentations combining Director, Flash, Photo-shop, such as department profile, lesson presentation, games and project presentations.

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<th>CS260D</th>
<th>COMPUTER PERIPHERALS AND INTERFACING DEVICES LAB.</th>
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LIST OF PRACTICALS
1. To identify various components and peripheral devices of computer.
2. Exercise on assembling a PC with peripherals and testing the same.
3. To study the SMPS circuit and measure its various voltages. Connecting SMPS to mother-board and other devices.
4. To study the operation and maintenance of CVT, HDD, FDD, BMP, PASER.
5. To study the operation and maintenance of CD ROM Drive.
6. To study the operation and maintenance of BMP.
7. To study the operation and maintenance of PASER.
8. To study the operations and maintenance of UPS.
10. To study the interfacing devices and its installations.

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<th>EC201D</th>
<th>DIGITAL ELECTRONICS- I</th>
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OBJECTIVE
The objective of this subject is to enable to students to know the basic concepts of digital electronics and gain familiarity with the available IC chips. The students will learn about number systems, logic gates, various codes, parities, Boolean algebra, mux and demux, flip-flop, counters, shift registers. This will form a broad base for studying digital system design, advanced microprocessors and further studies.
1. Introduction: Define digital and analog signals and systems; need of digitization and applications of digital systems.
2. **Number Systems:** Decimal; binary; octal; hexadecimal number systems; conversion of number from one number system to another including decimal points; binary addition; subtraction; multiplication; division 1’s and 2’s complement method of subtraction; bCD code numbers and their limitations; addition of BCD coded numbers, conversion of bCD to decimal and vice-versa, Excess-3 code; gray code; binary to gray and gray to binary conversion; concept of parity; single and double parity; error detection and correction using parity.

3. **Logic Gages:** Logic gates; positive and negative logic; pulse waveform; definition; symbols; truth tables; pulsed operation of NOT, OR, AND, NAND, NOR; EX-OR, EX-NOR gates; NAND and NOR as universal logic gates.

4. **Logic Simplification:** Rules and laws of Boolean algebra; logic expression; de Morgan’s theorems and their proof; Sum of products form; product of sum form (maxterms); simplification of Boolean expressions with the help of Rules and laws of Boolean algebra; Karnaugh mapping techniques up to 4 variables and their applications for simplification of Boolean expression.

5. **Arithmetic Circuits:** Half adder; full adder circuits and operation; Parallel binary adder; 2-bit and 4-bit binary full adder block diagram and working; Multiplexer/Demultiplexer, Base functions, symbols and logic diagrams of 4-inputs and 8-inputs; multiplexers; function/utility of 16 and 32 inputs multiplexers; Decoders; Display Devices and Associated Circuits; basic Binary decoder; 4-line to 16 line decoder circuit; BCD to decimal decoder; BCD to 7-segment decoder/driver; LED/LCD display.

6. **Encoders and Comparators:** Encoder; decimal to BCD encoder; decimal to BCD priority encoder, keyboard encoder; Magnitude comparators; symbols and logic diagrams of 2-bit and 4-bit comparators; Latches and Flip-Flops; Latch, SR-latch; D-latch, Flip-flop; difference between latch and flip-flop, S-R, D, flip-flop their operation using waveform and truth tables; race around condition; JK flip-flop; master slave; using waveform and truth tables.

7. **Counters:** Asynchronous counter; 4-bit Asynchronous, counter Asynchronous decode counter; Asynchronous counter; 4-bit synchronous binary counter; Asynchronous decode counter; Up/down Asynchronous counters; divide by N counter MODIFICATION-3, 5, 7, 12, Ring counter; cascaded counter; counter applications; Shift Registers; Shift registers functions; serial-in-serial out, serial-in-parallel-out; parallel-in-serial-out, parallel-in-parallel out, Universal shift register; shift register counter and applications of shift registers.

**TEXT BOOK**

**REFERENCE BOOKS**
OBJECTIVE
The course will cover 8085 in detail with sufficient exposure to the industrial applications. The course will also deal with the architecture, instruction sets and control applications of 8051 with introduction to 8086. The subject will deal in detail the configurations and instructional pair configuration systems and working of various peripheral interface chips. The study of microprocessors in terms of architecture, software and interfacing techniques leads to the understanding of working of CPU in a microcomputer. The development in microprocessors of 32 bit architecture brings them face-to-face with mainframe finding employment in R&D, assembly, repair and maintenance of hardware of microprocessors and computers..

1. **Microprocessor Architecture**: Intel 8085-Functions of ALU; Timing and Control unit; Registers," Data; Address and Control; Buses; Pin Configuration and functions of various pins; Instruction Word Size; Fetch; Execute Operation; Machine Cycle and States; Instruction and Data flow; Timing Diagram; Memory Read Write operation

2. **Instruction Set for Intel 8085**: Instruction and data formats; Addressing modes; Status Flags; Data transfer Arithmetic; Logical; Branch Group Machine Control instruction; looping; Counting and indexing, Use of Counters and Time Delays; Use of Stacks & Subroutines.

3. **Interfacing and Data Transfer Schemes**: Memory Mapped I/O and I/O mapped I/O schemes; Memory interfacing; I/O interfacing.

4. **Fundamental of programming**: Assembler instruction format; label; opcode and operand; Example of Assembly Language programming.

5. **Interrupts of 8085**: Interrupt process; Maskable & Non-maskable Interrupt; Steps to initiate and implement Interrupt, Interrupts priority, SIM & RIM instructions.

6. **Data transfer scheme**: DMA Data transfer; Synchronous; Asynchronous and Interrupt driven data transfer.

7. **8085 based Microcomputer System and its application**.

**TEXT BOOK**

**REFERENCE BOOKS**
Diploma/B.Tech Engineering Programme


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<th>EC251D</th>
<th>DIGITAL ELECTRONICS LAB.</th>
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LIST OF PRACTICLALS

1. Study of logic breadboard with verification of truth table for AND, OR, NOT, NAND, EX-OR, NOR gate.
2. Verification of NAND and NOR gate as universal gates.
3. Construction of half-adder and full adder circuits using EX-OR and NAND gate and verification of their operation.
4. Verify the operation of multiplexner using an IC.
5. Verify the operation of de-multiplexner using an IC.
6. Verify the operation of BCD to decimal decoder using an IC.
7. Verify the operation of BCD to 7 segment decoder using an IC.
8. Verify operation of SR, JK, D-flip-flop master slave JK flip-flop using IC.
10. Study of ring counter, Up/down counter.

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<th>EC252D</th>
<th>MICROPROCESSOR – I LAB.</th>
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LIST OF PRACTICLALS

1. Study of 8085 Microprocessor Kit used in laboratory Familiarization with Kit and identification of its various parts like keyboard, Memory, Timer, Interrupt Controller, Display Unit, Interface Unit.
2. Writing an assembly language program using mnemonics Addition of two 8 bit number.
3. Writing an assembly language program using mnemonics Subtraction of 8 bit number.
4. Writing an assembly language program using mnemonics Multiplication of 8 bit number.
5. Writing an assembly language program using mnemonics Division of 8 bit number.
6. Writing an assembly language program using mnemonics Finding average of N given Integers.
7. Writing an assembly language program using mnemonics To arrange the data array in ascending and/or descending order.
8. Writing an assembly language program using mnemonics Addition of two 16 Bit number.
9. Setting up 0 to 09 count BCD addition, BCD subtraction and other.
10. Study of 8255, 8257, 8259, 8279, 8253 study card using a 8 bit Microprocessor.

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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>
<thead>
<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**
1. Muriel; James & Jongeward; Dorothy; “Born to Win”; Signet Publishers; 1978
2. Harris; Thomas Anthony ; “I’m OK; You’re OK”; Galahad Books; 2004
3. Dr. Alex; K.; “Soft Skills”; 2009; S. Chand; 2009
**Diploma/B.Tech Engineering Programme**


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