Jagannath University

# Faculty of Engineering & Technology

# Diploma in Engg.

## (w.e.f. 2022-2025)

- **Regulations**
- **Scheme of Examination**

**[Computer Engineering]**

- **Detailed Syllabi**


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Jagannath University

## Faculty of Engineering & Technology

# Diploma in Engineering

# REGULATIONS

## *THE REGULATIONS FOR DIPLOMA IN ENGINEERING -3 YEAR PROGRAMME**

## *(CHOICE BASED CREDIT SYSTEM)*

# INDEX

# *THE REGULATIONS FOR DIPLOMA IN ENGINEERING -3 YEAR PROGRAMME**

# *(CHOICE BASED CREDIT SYSTEM)*

## 1. INTRODUCTION

Technical Education plays a vital role in Human Resource Development of the country by creating skilled man power, enhancing Industrial productivity. Diploma in Engineering -3 year programme is a professional course for learning of fundamental concepts . It helps to provide trained man power to carry out various trades in engineering . It also promotes entrepreneurial skills among the students. Jagan Nath University presently offers 3-Year Diploma courses in (i) Civil Engineering (ii) Computer Science Engineering (iii) Electrical Engineering (iv) Electronics and Communication Engineering (v) Mechanical Engineering.

Recently, the University Grants Commission (UGC) has stressed on speedy and substantive academic and administrative reforms in higher education for promotion of quality and excellence. The Action Plan proposed by UGC through its guidelines delimits the need to consider and adopt Semester System, Choice Based Credit System (CBCS) and Flexibility in Curriculum Development and Examination Reforms in terms of adopting Continuous Evaluation Pattern by reducing the weightage on the semester-end examination so that students enjoy a de-stressed learning environment.

## 2. TITLE AND COMMENCEMENT

2.1. These Regulations shall be called ***THE REGULATIONS FOR DIPLOMA IN ENGINEERING -3 YEAR PROGRAMME* (CHOICE BASED CREDIT SYSTEM)***

2.2. These Regulations shall come into force with effect from the academic year 2015- 2016.

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**Approved by AC & BOM vide resolution no. _____& dated _____*

*Wherever, these Regulations are silent, the University Regulations for Examination and Evaluation will be applicable.*

## 3. DEFINITIONS

a) **Programme:** means an educational programme leading to award of Diploma in Engineering 3 years.

b) **Academic Year:** means Two consecutive (one odd + one even) semesters constitute one academic year.

c) **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed courses [Core, Elective, Ability Enhancement Compulsory (AECC) & Skill Enhancement (SEC) ]

d) **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ outreach activities/ project work/ viva/ seminars/ term papers/assignments/ presentations/self-study etc. or a combination of some of these.

e) **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a diploma is prescribed in terms of number of credits to be completed by the students.

f) **Credit Point:** It is the product of grade point and number of credits for a course.

g) **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.

h) **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

i) **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.

j) **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

k) **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses

registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

l) **Semester:** Each semester will consist of 18 weeks of academic work equivalent to 90 actual teaching days and 3-4 weeks approximately of examination etc. The odd semester may be scheduled from July to December and even semester from January to June.

m) **Transcript or Grade Card or Certificate:** Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester.

n) **External Examiner**: shall mean an examiner who is not is the employment of the University.

o) **Student:** shall mean a person admitted to the Faculty/ Schools of the University for any of the academic programmes to which this policy is applicable.

p) **University:** shall mean Jagan Nath University, Jaipur.

q) **Internal Evaluation:** Continuous Assessment Test conducted during the semester.

r) **External Evaluation:** End-Term examination held at the end of each semester.

s) **Rounding off Marks:** shall mean, that if part is one-half or more, its value shall be increased to one and if part is less than half then its value shall be ignored for getting letter grade and grade point.

t) **Enrollment:** shall mean the student taking admission and registered for pursuing a course at Jagan Nath University

u) **Migration:** shall mean the student of Jagan Nath University migrating to another University/Institute or the student of other University/Institute taking admission to Jagan Nath University.

## 4. TYPES of COURSES

Courses in a programme may be of four kinds: Core, Elective, Ability Enhancement & Skill

Enhancement.

**a) Core Course:-**

There may be a Core Course in every semester. This is the course which is to be compulsorily studied by a student as a requirement to complete the programme in a said discipline of study.

**b) Elective Course:-**

Elective course is a course which can be chosen from a pool of papers. It may be

- Supportive to the discipline of study
- Providing an expanded scope
- Enabling an exposure to some other discipline/domain
- Nurturing student's proficiency/skill.

An Elective Course may be 'Discipline Centric/Specific' & Generic Elective

***(i)*** ***Discipline Centric/Specific Elective(DSE):*** Elective courses offered under the main discipline/subject of study is referred to as Discipline Centric/Specific.

***(ii)*** ***Generic/Open Elective(GE):*** An elective course chosen from an unrelated discipline/subject is called Generic/Open Elective. These electives will be focusing on those courses which add generic proficiency of students.

**c) Ability Enhancement Compulsory Courses (AECC):-**

AECC courses are based upon the content that leads to knowledge enhancement, for example: English Communication, Environment Science/ Studies, etc.

**d) Skill Enhancement Courses (SEC):-**

SEC Courses provide value based and/or skill based knowledge and may content both Theory and Lab/Training/Field Work. The main purpose of these courses is to provide students life-skills in hands- on mode so as to increase their employability.

## 5. THE COURSE AND THE DURATION

(a) There shall be a 3-Year – 6 Semester Course leading to the diploma of engineering

(b) Each Academic Year shall be divided into two Semesters, i.e. July to November / December and January to May / June.

(c) Each Semester shall consist of minimum 18 weeks.

(d) The Courses and the syllabi shall be proposed by the Faculty of Engineering and Technology approved by the Academic Council of the University time to time.

## 6. ELIGIBILITY FOR ADMISSION

**Diploma in Engineering**: An applicant who has passed $10^{th}$ class or its equivalent in aggregate as well as individual subject Mathematics and Science from any recognized board/council.

Provided that applicants who has passed $10^{th}$ class or its equivalent in aggregate as well as individual subject Mathematics and Science from any recognized board/council in distance or correspondence method shall also be considered as eligible for admission in Diploma Programme .

## 7. ADMISSION PROCEDURE

7.1 Admission shall be made strictly on merit by the university admission committee either by holding written admission test or the merit list prepared according to the marks obtained in the qualifying examination followed by interview of the candidates.

7.2 The names of the selected candidates, in order of merit, shall be notified in the office Notice Board and/or website. A selected student who fails to pay his/her admission fee

and other charges by the date fixed for such payment shall forfeit his/her claim for admission.

## 8. ATTENDANCE PROVISION FOR END TERM SEMESTER EXAMINATION

8.1 No student shall be allowed to appear in the end term semester examination in a paper if he/ she has not attended minimum of **75%** of the classes held in the paper concerned including tutorials, special lectures, study visits, practical trainings etc. conducted in respect of that paper.

8.2 If a student for any exceptional reason fails to attend **75%** of the classes held in any paper, the Dean / HoD of the department may allow him/ her to take the examination if he/she attended at least 65% of the classes held in the paper concerned and attended 75% of classes in all the papers taken together.

Provided that if the percentage of attendance is deficient on account of:-

(i) Participation in Inter-University, University or Inter-Collegiate Sports tournaments/Youth Festivals /University Level Debates/ Cultural Activities, National and International Tournaments, with the previous sanction of the Dean/HoD of Faculty Engineering & Technology

(ii) Voluntary donation of blood certified by a Government Doctor of Gazetted rank or University medical officer.

(iii) Attendance and/or participation in International/National / State level competitions;

(iv) Attendance at the extension lecture (s) organized by the Faculty of Engineering & Technology.

Credit may be given for the number of days on which lectures were delivered or sessional or sessional/practical work done during the period of attendance or participation aforesaid, provided that the total period of absence shall not exceed 15 days in a semester.

## 9. LATERAL ENTRY AND MIGRATION

9.1 A student who has completed 10+2 with physics, Chemistry & Mathematics or $12^{th}$ Technical or 2 Year ITI from NCVT Boad/ Council, may be permitted to take admission in the III Semester of the relevant or allied branch provided there are seats vacant in that branch.

9.2 Migration may be allowed as per University Rules

## 10. FORMAL DRESS CODE DURING CLASS HOURS AND INTERNSHIP

Formal Dress is to be worn during the normal class hours and during Project work, placement related activities

## 11. PROHIBITION TO REGISTER IN OTHER COURSES

The candidates admitted to the Course, shall not be allowed to pursue any other course except certificate course in any Indian or Foreign language or computer application being conducted by this University on part-time basis in the evening or through Distance Learning with prior permission of the Dean / HoD, Faculty of Engineering & Technology otherwise his candidature for Diploma Programme will be cancelled forthwith.

## 12. EXAMINATION AND EVALUATION

12.1 The medium of instructions and examination shall be English or Hindi

12.2 Candidates shall be examined according to the scheme of examination and syllabus as approved by the Academic Council from time to time.

12.3 To pass each semester examination, a candidate must obtain at least 40% marks in each written paper/sessional, practical work /Viva-Voce.

12.4 Each written paper for the respective semester examination shall be set and evaluation of the answer books shall be done as per the University rules.

12.5 The assessment of End Term Semester Examination will be made out of 70 (Seventy) marks in theory Papers and Internal Evaluation of 30 (Thirty) marks shall be made by the subject teacher, teaching the paper in accordance with the following rules:

| **Mid-Term Test** | **Normalised Mid-Term Marks (A)** | **Assignments (B)** | **Semester Attendance (C)** | **Total (A+B+C)** |
|---|---|---|---|---|
| 50 Marks | To be normalized to15 marks | 5 Marks | 10 Marks | 30 Marks |

Criteria for Awarding Semester Attendance Marks will be as prescribed by the University as follows:

a. Attendance above 95% : 10 Marks

b. Attendance between 91% to 95% : 9 Marks

c. Attendance between 86% to 90% : 8 Marks

d. Attendance between 81% to 85% : 7 Marks

e. Attendance between 75% to 80% : 6 Marks

f. Attendance between 65% to 74% : 5 Marks

12.6 The Dean/HoD will preserve the records of the sessional/practical work upto six months from the date of the declaration of the concerned semester examination.

## 13. INTERNAL EVALUATION: MID-TERM EXAMINATION

a) The schedule of Mid-Term tests shall be notified to the students by the University.

b) Questions papers for mid-term tests shall be set by the internal examiner from the 50% of the syllabus of the course. The answer books will be assessed by the teacher concerned. The assessed answer books will be shown to the students and grievances, if any will be handled by the teacher. The marks of the mid-term tests will be forwarded to the Controller of Examinations by the Head of the Department through the Dean of the Faculty.

c) No remedial Mid-Term Tests would be conducted.

## 14. EXTERNAL EVALUATION: END-TERM EXAMINATION

a) The End Term examinations shall ordinarily be held at the end of every semester i.e. November-December or May-June, as the case may be, as per the schedule to be notified by the Controller of Examination. The dates for the practical examinations would be decided by the HODs of respective departments in consultation with the Dean of the Faculty.

b) The examiners for the end-term examination will be appointed by the Vice-Chancellor from the panel of the examiners to be supplied by HOD / DEAN.

c) At least 50% of the paper setters for the end-term examination will be External Examiners.

d) The manuscript of the question paper set by the examiner will be moderated by the Moderation Committee consisting of (i) Dean of Faculty (ii) HoD of the Department .After modifications, if needed; it will be handed over to the COE for printing and conduct of examinations.

e) The answer books will be evaluated by the persons who set the question paper. In case of his inability to assess the answer books, for whatever reasons, the Vice-Chancellor may get them assessed by any other examiner from the Panel or Internal Examiner.

## 15. STANDARD OF PASSING THE SEMESTER EXAMINATIONS

A candidate, who fails in a semester examination, shall be exempted from re-appearing in the paper(s) in which he may have obtained at least 40% marks. Such a candidate shall be allowed to appear, for passing in the remaining paper(s), only at the next respective semester examinations.

Provided that a candidate for the Diploma 3-Year Course must pass all the examinations, i.e., I/II/III/IV/V/VI within five years of his admission to the first year class of the course failing which he will be deemed to be unfit for the course and shall not be allowed to appear as a regular student or as an ex-student unless has been otherwise allowed by the Academic Council of the University.

## 16. RE-APPEAR/IMPROVEMENT IN END TERM EXAM

a) The re-appear/improvement in End Term Examinations for Odd semester will be held along with the Odd Semester regular End Term examinations and for Even Semester with End Term examinations along with Even Semester regular End Term examinations.

b) A student who has to re-appear/improve in a End-Term examination shall be examined as per the syllabus, which was in force at the time when he/she took the examination.

c) A candidate who fails in a semester examination shall be exempted from re-appearing in the paper(s) in which he may have obtained min. pass marks. Such a candidate shall be allowed to appear, for passing in the remaining paper(s), only at the next respective semester examinations.

d) A candidate who has passed in a paper(s), may be allowed to improve the paper(s), only in the next respective semester examinations.

e) The previous internal marks already obtained by the student shall be taken into account without any modification.

## 17. SEMESTER PROMOTION

(a) A candidate who has appeared and failed or having been eligible but did not appear in the end term semester examination shall be promoted to the next higher semester.

(b) Students are required to successfully complete the entire course within 5 years from admission to the course.

## 18. CRITERION FOR AWARDING GRADING SYSTEM

**18.1 CRITERION for Awarding SGPA and CGPA:** The criterion for awarding the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) for the entire professional programme shall be as follows:

a) The criterion for passing in a subject is that a student should secure minimum 40% marks in individual paper.

b) A student obtaining less than pass marks as specified above, in each subject (sum of internal and End-Term examinations) he will be declared fail in that subject and will have to re-appear in a End-Term examination of the course in subsequent odd / even semester end term examination, subject to maximum permissible period of n+2 years / n+4 semesters to complete the course.

c) The University has adopted Absolute Grading System for converting marks into grades. The formula of 10- point grading system for conversion of marks obtained into Letter Grades and converting Letter Grades to Grade Point is given below:

**Table 1: Marks, Letter Grades and Grade Points**

| Marks | Letter Grade | Grade Points |
|---|---|---|
| 91-100 | O (Outstanding) | 10 |
| 81-90 | A+(Excellent) | 9 |
| 71-80 | A(Very Good) | 8 |
| 61-70 | B+(Good) | 7 |
| 51-60 | B(Above Average) | 6 |
| 46-50 | C(Average) | 5 |
| 40-45 | P (Pass)* | 4 |

| | | |
|---|---|---|
| 0-39 | F(Fail) | 0 |
| - | AB (Absent) | 0 |

***Passing Marks: Diploma- 40% in individual paper**

d) ***While converting the marks into Letter Grade, the rounding off marks must be considered.***

e) A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

f) For non credit courses "Satisfactory" or Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA.

**18.2 Computation of SGPA and CGPA :** The university has adopted UGC recommended procedure for computation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

a) The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the papers/ courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$\textbf{SGPA}\ (Si) = \Sigma\ (Ci \times Gi) / \Sigma Ci$$

Where Ci is the number of credits of the $i^{th}$ course and Gi is the grade point scored by the student in the $i^{th}$ course. The university shall issue Semester Grade Card to the student.

b) The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$\textbf{CGPA} = \Sigma\ (Ci \times Si) / \Sigma\ Ci$$

Where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

c) ***The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.***

**Illustration of Computation of SGPA and CGPA and Format for Transcripts**

**a) Computation of SGPA and CGPA**

**Illustration for SGPA**

| **Course** | **Credit** | **Grade Letter** | **Grade Point** | **Credit Point (Credit x Grade)** |
|---|---|---|---|---|
| Course/Paper 1 | 3 | A | 8 | 3x8=24 |
| Course/Paper 2 | 4 | B+ | 7 | 4x7=28 |
| Course/Paper 3 | 3 | B | 6 | 3x6=18 |
| Course/Paper 4 | 3 | O | 10 | 3x10=30 |
| Course/Paper 5 | 3 | C | 5 | 3x5=15 |
| Course/Paper 6 | 4 | B | 6 | 4x6=24 |
| | **20** | | | **139** |

**Thus, SGPA= 139/20= 6.95**

**b) Illustration for CGPA**

| **Semester-1** | **Semester-2** | **Semester-3** | **Semester-4** | **Semester-5** | **Semester-6** |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Credit: 20<br>SGPA:6.9 | Credit: 22<br>SGPA:7.8 | Credit: 25<br>SGPA:5.6 | Credit: 26<br>SGPA:6.0 | Credit: 26<br>SGPA:6.3 | Credit: 25<br>SGPA:8.0 |

**Thus, CGPA**= 20x6.9+22x7.8+25x5.6+26x6.0+26x6.3+25x8.0

---------- = **6.73**

144

## 19. CRITERION FOR CREDIT

(a) In case a student secures minimum passing marks (40% and above) in a Theory / Practical paper, he / she will earn the assigned credit of that particular paper.

(b) A student is eligible for the award of diploma, if he / she earns minimum credits required for that particular programme. However if the student has not acquired minimum credits required for obtaining the diploma, he will have to appear in some of the papers in which he has not got credit to fulfill the minimum requirement of Credits.

(c) **MAXIMUM & MINIMUM CREDITS**

The total number of the credits of the Diploma 3-Year Programme is 116

Each student shall be required to appear for examination in all courses. However, for the award of the Diploma a student should secure at least 109 credits.

***Relaxation of credits will be given only in Electives Papers.***

## 20. AWARD OF THE DIPLOMA

A student shall be eligible for the award of the Diploma in Engineering after he/she has successfully completed all the prescribed courses in all the semesters and secured minimum Credits required for award of Diploma.

## 21. WITHDRAWAL OF DIPLOMA

A Diploma awarded by the University may be withdrawn if it is found at the later stage that the candidate has submitted any forged document or ineligible at the time of admission to the course.

## 22. SCHOLARSHIPS, AWARDS AND MEDALS

Students excelling in academics, co-curricular and extracurricular activities are felicitated through various awards and scholarships instituted by the University.

A candidate with highest CGPA would be declared Topper. In case of tie of CGPA, the student senior in age will be the topper. Gold, Silver and Bronze medal will be awarded on the basis of securing first three highest CGPA in the course concerned.

## 23. JURISDICTION

All disputes are subject to the jurisdiction at Jaipur.

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**Program outcomes (POs)**

**PO**1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO**2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO**3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO**4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO**5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO**6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO**7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO**8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO**9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO**10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO**11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO12. Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

# FACULTY OF ENGINEERING & TECHNOLOGY

## Diploma in Computer Engineering

## DIPLOMA IN ENGINEERING 2022-25
## FACULTY OF ENGINEERING & TECHNOLOGY
## I and II Semester (Common for All )

| **SEMESTER I** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **THEORY PAPERS** | | **No. of Teaching Hours** | | | **Marks Allocation** | | | |
| **Code** | **Subject/Paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIP101 | **Applied Physics -I** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP102 | **Computer Fundamental** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP103 | **Applied Mathematics-I** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP104 | **General English Skills** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP105 | **Applied Chemistry** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |
| DIP106 | **Physics Lab-I** | - | - | 2 | 30 | 20 | 50 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DIP107 | **Computer Fundamental Lab** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP108 | **Engineering Drawing Lab** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP109 | **Basic Workshop Practice Lab – I** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP110 | **Chemistry Lab** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP111 | **Social Outreach, Discipline & Extra Curricular Activities** | - | - | - | 50 | - | 50 | 1 |
| **TOTAL** | | **15** | **5** | **10** | **350** | **450** | **800** | **26** |
| | | | | | | | | |

## SEMESTER II

| **THEORY PAPERS** | | **No. of Teaching Hours** | | | **Marks Allocation** | | | |
|---|---|---|---|---|---|---|---|---|
| **Code** | **Subject/Paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIP201 | **Applied Physics II** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP202 | **Advanced English Writing Skills** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP203 | **Engineering Mechanics** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP204 | **Applied Mathematics II** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP205 | **Environmental Sciences** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |
| DIP206 | **Physics Lab-II** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP207 | **English and Communication Lab** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP208 | **Basic Workshop Practice Lab - II** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP209 | **Social Outreach, Discipline & Extra Curricular Activities** | - | - | - | 50 | - | 50 | 1 |
| **TOTAL** | | **15** | **05** | **06** | **290** | **410** | **700** | **24** |

## SEMESTER III

| Theory Papers | | No. of Teaching hours | | | Marks Allocation | | | |
|---|---|---|---|---|---|---|---|---|
| **Code** | **Subject/paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIPCS301 | Programming & Problem Solving Through 'C' | 4 | - | - | 30 | 70 | 100 | 4 |
| DIPCS302 | Computer System Architecture | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS303 | Operating System Principles | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS304 | Internet and Web Technologies | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS305 | Basics of Digital Electronics | 3 | 1 | - | 30 | 70 | 100 | 4 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |
| DIPCS306 | C Programming Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS307 | Internet & Web Technology Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS308 | Digital Electronics Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS309 | Social Outreach, Discipline & Extra Curricular Activities | - | - | - | 50 | - | 50 | 1 |
| **Total** | | **16** | **04** | **06** | **290** | **410** | **700** | **24** |

## SEMESTER IV

| Theory Papers | | No. of Teaching hours | | | Marks Allocation | | | |
|---|---|---|---|---|---|---|---|---|
| **Code** | **Subject/paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIPCS401 | Data Communication | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS402 | Data Base Management System | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS403 | Data Structure & Algorithm | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS404 | Microprocessor and Interfacing | 3 | - | - | 30 | 70 | 100 | 3 |
| DIPCS405 | PC Maintenance and Trouble Shooting | 3 | 1 | - | 30 | 70 | 100 | 4 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |
| DIPCS406 | DBMS Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS407 | DSA Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS408 | Microprocessor and Interfacing Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS409 | PC Maintenance and Trouble Shooting Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS410 | Social Outreach, Discipline & Extra Curricular Activities | - | - | - | 50 | - | 50 | 1 |
| **Total** | | **15** | **04** | **08** | **220** | **430** | **750** | **24** |

## SEMESTER V

| Theory Papers | | No. of Teaching hours | | | Marks Allocation | | | |
|---|---|---|---|---|---|---|---|---|
| **Code** | **Subject/paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIPCS501 | Basics of Electronic Devices and Circuits | 3 | - | - | 30 | 70 | 100 | 3 |
| DIPCS502 | Object Oriented Programming Through C++ | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS503 | Unix, Shell Programming and Administration | 3 | - | - | 30 | 70 | 100 | 3 |
| DIPCS504 | Software Engineering | 3 | - | - | 30 | 70 | 100 | 3 |
| DIPCS505 | Dot Net Technology | 3 | - | - | 30 | 70 | 100 | 4 |
| DIPCS506 | Personality Development Skills | 3 | - | - | 30 | 70 | 100 | 3 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |
| DIPCS507 | EDC Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS508 | OOPS Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS509 | Unix & Shell Programming Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS510 | S.E. Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS511 | .Net Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS512 | Minor Project | - | - | 1 | 30 | 20 | 50 | 1 |
| DIPCS513 | Social Outreach, Discipline & Extra Curricular Activities | - | - | - | 50 | - | 50 | 1 |
| **Total** | | **18** | **01** | **11** | **410** | **540** | **950** | **27** |

## SEMESTER VI

| Theory Papers | | No. of Teaching hours | | | Marks Allocation | | | |
|---|---|---|---|---|---|---|---|---|
| **Code** | **Subject/paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIPCS601 | Computer Network | 3 | 1 | - | 30 | 70 | 100 | 3 |
| DIPCS602 | Data warehouse and mining | 4 | - | - | 30 | 70 | 100 | 4 |
| DIPCS603 | Introduction to Network Security and Cryptography | 3 | 1 | - | 30 | 70 | 100 | 3 |
| DIPCS604 | Java Tools | 3 | 1 | - | 30 | 70 | 100 | 3 |
| DIPCS605 | PHP & MySql | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS606 | GD & PI | 3 | - | - | 30 | 70 | 100 | 3 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |
| DIPCS607 | Core Java Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS608 | Core PHP Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS609 | Major Project | - | - | 2 | 90 | 60 | 150 | 3 |
| DIPCS610 | Project cum Seminar | - | - | 1 | 30 | 20 | 500 | 1 |
| DIPCS611 | Social Outreach, Discipline & Extra Curricular Activities | - | - | - | 50 | - | 50 | 1 |
| **Total** | | **19** | **04** | **07** | **410** | **540** | **950** | **27** |

# DIPLOMA IN ENGINEERING 2022-25
# FACULTY OF ENGINEERING & TECHNOLOGY
## I and II Semester (Common for All )

| **SEMESTER I** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **THEORY PAPERS** | | **No. of Teaching Hours** | | | **Marks Allocation** | | | |
| **Code** | **Subject/Paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIP101 | **Applied Physics -I** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP102 | **Computer Fundamental** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP103 | **Applied Mathematics-I** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP104 | **General English Skills** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP105 | **Applied Chemistry** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching** | | | **Sessional** | **Practical** | **Total** | **Credits** |

| | | Hours | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DIP106 | **Physics Lab-I** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP107 | **Computer Fundamental Lab** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP108 | **Engineering Drawing Lab** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP109 | **Basic Workshop Practice Lab – I** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP110 | **Chemistry Lab** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP111 | **Social Outreach, Discipline & Extra Curricular Activities** | - | - | - | 50 | - | 50 | 1 |
| **TOTAL** | | **15** | **5** | **10** | **350** | **450** | **800** | **26** |
| | | | | | | | | |

**SEMESTER II**

| **THEORY PAPERS** | | **No. of Teaching Hours** | | | **Marks Allocation** | | | |
|---|---|---|---|---|---|---|---|---|
| **Code** | **Subject/Paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIP201 | **Applied Physics II** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP202 | **Advanced English Writing Skills** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP203 | **Engineering Mechanics** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP204 | **Applied Mathematics II** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIP205 | **Environmental Sciences** | 3 | 1 | - | 30 | 70 | 100 | 4 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |
| DIP206 | **Physics Lab-II** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP207 | **English and Communication Lab** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP208 | **Basic Workshop Practice Lab - II** | - | - | 2 | 30 | 20 | 50 | 1 |
| DIP209 | **Social Outreach, Discipline & Extra Curricular Activities** | - | - | - | 50 | - | 50 | 1 |
| **TOTAL** | | **15** | **05** | **06** | **290** | **410** | **700** | **24** |

## DIP101: APPLIED PHYSICS-I

**UNIT 1: Measurement:** Physical Quantities, Units for Measurement, Fundamental and Derived Units, Systems of Units, SI Units, Dimensional Analysis, Uses of Dimensional Analysis, Limitations of Dimensional Analysis, Accuracy in Measurement, Errors in Measurement, Combination of Errors, Order of Magnitude, Significant Digits.

**UNIT 2: Motion and Force:** Distance and Displacement, Speed and Velocity, Relative Velocity, Acceleration and Retardation, Uniformly Accelerated Motion, Equations of Motion, Force and Inertia, Momentum, Impulse, Newton's Law of Motion with examples, Law of Conservation of Momentum, Friction, Laws of Friction, Sliding and Rolling Friction.

**UNIT 3: Gravitation:** Law of Universal Gravitation, Acceleration due to Gravity, Variation in the value of 'g', Inertial and Gravitational Mass, Gravitational Field, Gravitational Potential Energy, Gravitational Potential, Escape Velocity, Artificial Satellite, Geostationary Satellite, Polar Satellite, Weightlessness in Satellites, Kepler's Laws of Planetary Motion.

**UNIT 4: Properties of Matter:** Elasticity, Stress, Strain, Hooke's Law, Young's Modulus, Bulk Modulus, Modulus of Rigidity, Poisson's Ratio, Surface Tension, Surface Energy, Cohesive and Adhesive Force, Angle of Contact, Capillarity, Stream Line and Turbulent Flow, Viscosity, Coefficient of Viscosity, Reynold's Number.

**UNIT 5: Transfer of Heat:** Modes of Heat Transfer, Isothermal Surface and Temperature Gradient, Coefficient of Thermal Conductivity, Black Body, Reflecting Power, Absorbing Power, Transmitting Power and Emissive Power, Kirchhoff's Law, Wein's Displacement Law, Stefan's Law, Planck's Law of Radiation, Newton's Law of Cooling.

***Reference books:***


1. Applied Physics Vol. I & II, TTTI Publication Tata McGraw Hill, Delhi
2. Basic Applied Physics by R K Gaur; Dhanpat Rai Publications
3. Simple Course in Electricity and Magnetism by C L Arora, S Chand and Co, New Delhi
4. Fundamental Physics- Vol. I and II by Gomber and Gogia; Pardeep Publications, Jalandhar
5. Concepts in Physics by HC Verma, Bharti Bhawan Ltd., New Delhi
6. Physics XI &XII, NCERT, New Delhi
7. Physics XI &XII Rajasthan Board, Ajmer


**COURSE OUTCOMES OF APPLIED PHYSICS I**

**At the end of the course, the student will be able to**:

CO1: Develop understanding about the usage of different measuring instruments.

CO2: Enhance knowledge for various types of forces and motions.

CO3: Apply concept of gravitation to understand various engineering problems.

CO4: To identify general properties of materials.

CO5: To learn different modes of heat transfer and thermal laws

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CO2 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| CO3 | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 3 | 1 | 1 | 1 |
| CO4 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 1 |
| CO5 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |

## DIP102: COMPUTER FUNDAMENTALS

## Course Objective:

- To give the basic knowledge of Computer hardware and application software to the students.
- Students able to learn how computers work and how they can be used to make your work more efficient.
- Also Course the basic utilization of the MS Office software package.

**UNIT I:**

Computer System: Basics of computer systems, history, types and Generation of computer, capability and limitations of computer systems. Hardware organization: Anatomy of a digital computer; Internal architecture of CPU.

**UNIT II:**

Memory Units: Memory Hierarchy, Primary Memory, Secondary Memory, cache memory. Storage Devices, Input and Output Devices.

**UNIT III:**

Number system & Conversions: decimal, binary, octal and hexadecimal number systems and their inter conversions, 1's and 2's complement representation,

Binary Arithmetic operations: addition, subtraction, multiplication, division.

**UNIT IV:**

Word processor: Introduction to MS-Word, Starting MS-Word, Opening Document, Typing and Editing, Copying, Inserting, Moving, Deleting, Copying from One Document to Others, Undo, Redo, Spell Check, Find and Replace, Formatting, Characters and Fonts, Spacing, Removing Characters Formatting, Inserting Symbols, Paragraphs, Page Setting, Header and Footer, Page Breaks, Borders and Shading, Print Preview and Printing; Tables and Columns

**UNIT V:**

Electronic Spread Sheet: Introduction to MS-Excel, Working with Spread Sheet, Editing the Worksheet, Worksheet Formatting, Formula Entering, Saving and Printing Work Book

**References:**


1. Sinha, P.K. Computer Fundamentals (BPB Publications).
2. Niranjan Mansal and Jayshri Saraogi Computer Made Easy For Beginners (Hindi)
3. Satish Jain, Shashank Jain and Madhullika Jain. It Tools and Applications (BPB Publications)

4 MS Office 2000. Joe Habraken

5 Rapidex Computer Course (Pustak Mahal)

6 Davinder Singh Minhas- Dynamic Memory Computer Course (Fusin Books), New Delhi

**COURSE OUTCOMES OF COMPUTER FUNDAMENTALS**

**At the end of the course, the student will be able to**:

CO1: Identify computer hardware and peripheral devices

CO2: Familiar with Memory and Storage.

CO3: Understand Number system.

CO4: Accomplish creating basic documents, worksheets, presentations with their properties.

CO5: Experience working with spread sheet.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | M | L | L | - | - | - | - | - | - | - | - | - |
| CO2 | L | L | L | - | - | - | - | - | - | - | - | - |
| CO3 | M | H | H | - | - | - | - | - | - | - | - | - |
| CO4 | L | M | M | L | L | - | - | - | L | L | - | L |
| CO5 | L | M | M | L | M | - | - | - | L | M | - | L |

# DIP103: APPLIED MATHEMATICS-I

**Unit-I** :

Introduction to Different Types of Expansion: Factorial Notation , Meaning of C(n, r), P(n, r) , Binomial Theorem for Positive Index, any Index , Exponential Theorem , Logarithm Theorem, Complex umber: Definition of Complex Number , Operations on Complex Number ( Add., Sub., Multiplication, Division) , Conjugate Complex Number , Modulus and Amplitude of a Complex Number , Polar form of a Complex Number

**Unit-II** :

Trigonometry: Allied Angle( sin (180±A), sin (90±A) etc., Sum and Difference Formula (without proof) and their Application Product Formula and C-D Formula , T-Ratios of Multiple and Sub-Multiple Angles (2A, 3A, A/2) , Solution of Trigonometric Equations : sin X = 0, tan X = 0, cos X = 0, sin X=A, cos X =A & tan x = A

**Unit-III** :

Matrices and Determinants: Definition and Properties of Determinants , Definition and Types of Matrix , Transpose of a Matrix, Symmetric, Skew Symmetric Matrices, Orthogonal matrices, , Minors and Cofactors , Adjoint and Inverse of a Matrix , Cramer's Rule , Solution of Simultaneous Linear Equations by Inverse Matrix Method. Numerical Integration : Trapezoidal Rule , Simpson's 1/3 Rule , Simpson's 3/8 Rule , Newton - Raphson Rule

**Unit-IV:**

Two Dimensional Coordinate Geometry: General Introduction , Distance Formula and Ratio Formula , Co-ordinate of Centroid, In-Centre, Ortho-Centre and Ex-Centre of a Triangle , Area of Triangle , Straight Line, Slope form, Intercept form, Perpendicular form, One Point Slope form, Two Point form & General form , Angle between Two Lines , Perpendicular Distance of a Line from a Point

**Unit- V**:

Conic: Circle :Definition and Standard Equations , Equations of Tangent and Normal at a Point (simple problems ) , Parabola : Definition and Standard Equations , Equations of Tangent and Normal at a Point

(Simple problems ) , Ellipse and Hyperbola : Definition and Standard Equations , Equations of Tangent and Normal at a Point (simple problems )

**REFERECE BOOKS** :

| | |
|---|---|
| 1. Mathematics XI & XII | NCERT, New Delhi |
| 2. Mathematics XI & XII | Rajasthan Board, Ajmer |
| 3. Polytechnic Mathematics | H. K. Dass |

## DIP104 : ENGLISH AND COMMUNICATION SKILLS

**Unit I: Grammar**

1. Usage of Tense.
2. Articles (A, an, the)
3. Active & Passive voice
4. Direct & Indirect Speech.
5. Modal Verbs.

**Unit II: Comprehension**

1. The Luncheon: W.S. Maugham
2. How Much Land Does a Man Need?: Leo Tolstoy
3. The Last Leaf: O. Henry
4. If : Rudyard Kipling

**Unit III: Composition**

1. Paragraph Writing.
2. Letter Writing.
3. E-Mails
4. Resume Writing.

**Unit IV Elements of Communication**

1. Communication: Meaning, Importance and Process
2. Functions/Objectives of Communication

3. Barriers to Communication**.**
4. Qualities of good Communication

**Unit V Types of Communication**

1. Verbal and Non- Verbal Communication
2. Formal and Informal Communication
3. Professional Communication
4. Interpersonal Communication and Methods to Improve It.

**Recommended Books:**


1. English for Competitive Examinations, Prof. R.P.Bhatnagar, Macmillan Publications.
2. "Current English Grammar and Usage with Composition" by R.P. Sinha, Oxford University Press (New Delhi).
3. Effective Technical Communication By M Ashraf Rizvi Tata McGraw-Hill Companies, New Delhi.
4. Communication Skills by sanjay kumar & Pushp Lata. Oxford University Press (New Delhi)


## DIP105 : APPLIED CHEMISTRY

**UNIT-I**

**Atomic Structure**: Constituents of the Atom**,** Bohr's Model of the Atom, Quantum Number and Electronic Energy Levels, Aufbau's Principle, Pauli's Exclusion Principle, Hund's Rule, $n + l$ Rule, Electronic Configuration of Elements ( s,p,d Block Elements)

**Development of Periodic Table:** Modern Periodic Law, Long form of Periodic Table.Study of Periodicity in Physical and Chemical Properties with special reference to : - Atomic and Ionic Radii, Ionisation Potential. Electron Affinity. Electronegativity. Variation of Effective Nuclear Charge in a Period. Metallic Character.

**UNIT -2**

**Carbon Chemistry:** Definition of Organic Chemistry. Difference between Organic and Inorganic Compounds. Classification and Nomenclature - Open Chain and Closed Chain Compounds, IUPAC

System of Nomenclature. (upto C5). **New Engineering Materials:** Superconductors, Organic Electronic Materials, Fullerences, Optical Fibres

**UNIT -3**

**Metals and Alloys:** General Principles and Terms listed in Metallurgy, Metallurgy of Iron and Steel, Different forms of Iron, Effect of Impurities on Iron and Steel, Effect of Alloying Elements in Steel. Extraction of Fe, Cu, Al and their important ores.

**Kinetic Theory of Gases**: Postulates of kinetic Theory, Ideal Gas Equation, Pressure and Volume Corrections, Vender Walls Equations, Liquefaction of Gases, Critical Pressure and Critical Temperature for Liquefaction. Liquefaction of Gases by Joule – Thomson Effect, Claude's Method and Linde's Method

**UNIT-4**

**Water:** The sources of water, common Impurities, soft and hard water, Hardness of water, degrees of hardness and its effects, determination of hardness by various techniques, Municipal Water supply, requisites of drinking water, purification of water by sedimentation,

filtration, reverse osmosis (RO), sterilization, chlorination. treatment by preheating, lime-soda process, permutit de-ionizer or demineralization.

**UNIT-5**

**Electrochemistry:** Redox reactions; conductance in electrolytic solutions, specific and molar conductivity variations of conductivity with concentration, Kohlrausch's Law, electrolysis and laws of electrolysis (elementary idea), dry cell – electrolytic cells and Galvanic cells; lead accumulator, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells. Relation between Gibbs energy change and EMF of a cell, fuel cells;

**REFFERED BOOKS :**

1. Engineering Chemistry II- Mathur and Agarwal
2. Chemistry of Engineering Materials C.V. Agarwal
3. Engineering Chemistry P.C. Jain and Monika
4. Engineering Chemistry M.M. Uppal

5. Engineering Chemistry V.P.Mehta Jain Bros. Jodhpur

6. Hand book of Technical Analysis Bannerji Jain Bros.Jodhpur

7. Inorganic Chemistry Shivhare & Lavania.

8. Organic Chemistry Kumar & Mehnot

9. A Text book of Engineering Chemistry S. K. Jain & K. D. Gupta

10. Engineering Chemistry Dr. K.L. Menaria & Dr Praveen Goyal

## DIP106: APPLIED PHYSICS-I LAB

**List of Experiments:**

1. To study of least count, error analysis and curve fitting.
2. Conversion of a Galvanometer into an Ammeter.
3. Conversion of a Galvanometer into Voltmeter.
4. To determine the acceleration due to gravity by using a simple pendulum.
5. To determine the diameter of given material using Screw gauge.
6. To determine the internal diameter, outer diameter and depth of a calorimeter by using Vernier caliper.
7. To determine the height of given spherical surface by using Spherometer.
8. To determine the wavelength of He -Ne Laser beam.
9. To determine minimum deviation angle for different light using prism and spectrometer

## DIP107 : COMPUTER FUNDAMENTAL LABORATORY

**Course Objective:**

- To Understand the Basics of Operating systems
- To Undestand how to use software packages in day to day activities.
- To to identify word processing terminology and concepts, Create technical documents, Animation and Design document, format and edit documents, use simple tools and utilities, Mail merge,Graph ,Chart, Reports and Mathematical expressions.

**List of Experiments :**

1. Create simple news letter in ms word.

2. Create greeting card in ms word.

3. Create a mail merge letter in MS Word.

4. Create a cover page of the project report.

5. Create a simple presentation in MS Power Point to list simple dos commands, hardware, software.
6. In Power Point create an animation with video and sound.

7. In MS Excel create a report containing the pay details of the employee with followings:
   It contains: sl no, name, employee id
   Enter the following formula to calculate the respective values.
      da (60% of basic)
      hra (7.5% of basic)

8. Create a student result sheet.

9. Create a pie chart for a sample data and give legends

10. create a macro which creates a line chart using the data in the worksheet.

## COURSE OUTCOMES OF COMPUTER FUNDAMENTAL LABORATORY

**At the end of the course, the student will be able to**:

CO1: Animate and Design the document.

CO2 : Create Format cells, rows, columns, and entire worksheets.

CO3: Create and use pivot tables and pivot charts.

CO4:Create charts and diagrams for data.

CO5:Create data lists and forms.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 3 | 3 | - | 1 | 2 | 2 | 2 | 2 | 3 | 3 |
| CO2 | 3 | 2 | 2 | 2 | - | - | 2 | 2 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 3 | 2 | 2 | - | - | 2 | 2 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 3 | - | 2 | 3 | 3 | 2 | 2 | 3 | 3 |
| CO5 | 2 | 3 | 3 | 3 | - | - | 2 | 2 | 3 | 3 | 3 | 3 |

## DIP108 : ENGINEERING DRAWING

Preparation of following on Imperial Size Drawing Sheet:

1.1 Lines, Letters and Scales

1.2 Geometrical Constructions and Engineering Curve

1.3 Projection of Lines

1.4 Projection of Planes

1.5 Projection of Solids

1.6 Orthographic Projections of Simple objects

1.7 Section and Development of Surfaces of Solids

i.e. Cone, Cylinder, Sphere etc.

Preparation of following Drawings in Sketch Book (Home Assignment) :

2.1 Lettering (On Graph Sheet)

2.2 Projections of Points in Different Quadrants

2.3 Isometric Projections of Various Planes

## DIP109: BASIC WORKSHOP PRACTICE - I

### ELECTRICAL WORKSHOP

1. Study of the various electrical symbol.
2. Study of the tools used in electrical works with diagram.
3. Study of the electrical apparatus, multimeter, ammeter, voltmeter, and wattmeter.
4. Study the various type of electrical wiring (1) Batten wiring (2) Casing- capping wiring (3) C**on**duit wiring
5. Study of the electrical iron and electrical rod.
6. Study of the electrical fan.
7. Study of the electrical heater.
8. Study of the various type of lamps.
9. Study of the florescent lamp.

10 Study of the electrical energy meter (single phase).

### ELECTRONIC WORKSHOP

1. Explain and measurement of the resistant.
2. Study and measurement of the electronic component and symbols.

3. Study of the types of switches.
4. Study of the function generator.
5. Study of the cathode Ray oscilloscope.
6. Practice of the soldering-de soldering iron.

## DIP110 : APPLIED CHEMISTRY LAB

**List of Experiments :-**

1. To determine the strength of a given unknown copper sulphate solution (Iodometrically) with titrate Hypo (sodium thiosulphate) solution.

2. To determine the strength of a given unknown FAS solution with titrate potassium dichromate solution using N-phenyl anthranilic acid (internal indicator).

3. To determine the viscosity and viscosity index of a given sample of lubricating oil using Redwood viscometer No.1

4. To determine the flash and fire point of a given sample of lubricating oil using Pensky Marten's apparatus.

5. Determine the cloud and pour point of a given sample of lubricating oil.

6. Determination of hardness of water by complexometric method (using EDTA).

7. To estimation the amount of sodium hydroxide and sodium carbonate in the given alkali mixture solution (or in water sample) by titrating against an intermediate hydrochloric acid using phenolphthalein and methyl orange indicator.

8. Determine the pH of an acid (strength of an acid) pH – metrically.

9. Determine the strength of a given unknown HCl solution by titrating it against NaOH solution (Conductometric analysis).

**10.** To determine the moisture and ash content in a given sample of coal by proximate analysis**.**

## DIP111: Social Outreach, Discipline & Extra Curricular Activities

This course aims to cultivate self-confidence, leadership, and community responsibility. It influences academic and personal development, fostering civic responsibility. Students grasp the value of social work and discipline's significance. They contribute to social up-gradation through engagement in organizations, blood donation, awareness programs, and personality development initiatives.

## DIP201: APPLIED PHYSICS-II

**UNIT 1: Electrostatics and Magnetism:** Electric Charge, Conservation of Charge, Coulomb's Law, Principle of Superposition, Electric Field and Potential, Electric Field and Potential due to Point Charge, Electrostatic Potential Energy, Current, Resistance, Ohm's Law, Magnetic Field, Biot-Savart's Law and its Applications.

**UNIT 2: Semiconductor Physics:** Solids, Energy Bands in Solids, Conductors, Insulators and Semiconductors, Intrinsic and Extrinsic Semiconductors, Conductivity and Resistivity of Semiconductors, P-N Junction Diode, Biasing and Characteristic Curves, Rectifier, Solar Cell, Zener Diode, LED.

**UNIT 3: Alternating Current:** Peak Value, Average Value and Root Mean Square Value of Alternating Voltage and Current, Reactance and Impedance, AC Circuits containing R, C, L, R-C, R-L, L-C and L-C-R, Resonant Circuits and their Characteristics, Power of an AC Circuit, Choke Coil, Transformer, Dynamo, D. C. Motor, Starter.

**UNIT 4:Optics:**Reflection and Refraction of Light, Laws of Refraction, Critical Angle, Total Internal Reflection,Refraction of Light at a Spherical Surface, Image, Mirrors, Lenses and Prism, Formation of Image by Lenses, Lens Formula, Linear Magnification, Refractive Index of medium of Prism, Dispersion of Light, Spectrum, Angular Dispersion.

**UNIT 5: Oscillation and Waves:** Periodic Motion, Simple Harmonic Motion, Displacement Equation, Phase and Phase difference, Velocity, Acceleration and Energy of SHM, Simple Pendulum, Wave Motion, Transverse and Longitudinal Waves, Progressive and Stationary Waves, Principle of Superposition of Waves, Sound Waves, Interference of Sound Waves.

***Reference books:***

1. Applied Physics Vol. I & II, TTTI Publication Tata McGraw Hill, Delhi
2. Basic Applied Physics by R K Gaur; DhanpatRai Publications
3. Simple Course in Electricity and Magnetism by C L Arora, S Chand and Co, New Delhi
4. Fundamental Physics – Vol. I and II by Gomber and Gogia; Pardeep Publications, Jalandhar
5. Concepts in Physics by HC Verma,BhartiBhawan Ltd., New Delhi
6. Physics XI &XII, NCERT,New Delhi
7. Physics XI &XII Rajasthan Board,Ajmer

## DIP202 : ADVANCED ENGLISH

**Unit-I (Grammar)**

1. Modal
2. Preposition
3. Conjunction

**Unit-II (Composition)**

1. Resume writing
2. Report writing
3. Advertisement

**Unit-III (Personality)**

1. Define Personality
2. Types of Personality
3. How to develop one's personality

**Unit-IV (Elements of Communication)**

1. Meaning
2. Barriers to communication
3. Functions / Objectives of Communication

**Unit-V (Poems)**

1. 'No men are foreign' – by James Kirk up
2. 'Death, Be not Proud' – by John Donne

## DIP203 : ENGINEERING MECHANICS

**Unit I**

Force System: Introduction, force, principle of transmissibility of force, resultant of a force system, resolution of a force, moment of force about a line. Varigon's theorem, Lami's theorem. Force body diagram.

**Unit II**

Centroid & Moment of Inertia: Location of centroid and center of gravity, Moment of inertia, Parallel axis and perpendicular axis theorem, Radius of gyration, M.I of composite section, Polar Moment of inertia, Lifting Machines: Mechanical advantage, Velocity Ratio,

**Unit III**

Friction: Types of Friction, Laws of friction, Angle of friction, Angle of repose, Ladder, Wedge, Belt Friction. Belt Drive: Types of belts, Types of belt drives, Velocity ratio, Effect of slip on Velocity ratio, Length of belt, Ratio of tensions and power transmission by flat belt drives.

**Unit IV**

Kinematics of Particles and Rigid Bodies: Velocity, Acceleration, Types of Motion, Equations of Motion, Rectangular components of velocity and acceleration, Angular velocity and Angular Acceleration, Radial and transverse velocities and accelerations,

**Unit V**

Work, Energy and Power: Work of a force, weight, spring force and couple, Power, Efficiency, Energy, Kinetic energy of rigid body, Principle of work and energy, Conservative and Nonconservative Force, Conservation of energy.

**References Books:**

1. Vector Mechanics for Engineers, Beer and Johnston, Tata McGraw-Hill.
2. Engineering Mechanics, Hibbeler, Pearson Education.
3. Engineering Mechanics, Meriam and Kraige, John Wiley & Sons.

4. Engineering Mechanics, Timoshenko and Young, Tata McGraw-Hill.
5. Engineering Mechanics, Shames, Pearson Education.
6. Engineering Mechanics, Boresi and Schmidt, CL-Engineering.
7. Engineering Mechanics, Andrew Pytel & Kiusalas, Cengage Learning.

## DIP204 : APPLIED MATHEMATICS-II

**Unit-I**

Function: Definition of Function , Range and Domain of Function , Types of Function , Absolute Value Function , Exponential value Function , Identity Function , Reciprocal Function , Rational and Irrational Function , Increasing and decreasing Function , Limits , Concept of Limit , L.H.L., R.H.L. , Limit of Standard Functions, Concept of Continuity and Differentiability at a Point (simple Problems)

**Unit-II:**

Differential Calculus : Standard Formulae (Except Hyperbolic Function) Derivative of Sum, difference, Multiplication and Division of two Functions ,Differentiation of Function of a Function , Logarithmic Differentiation , Differentiation of Implicit Functions , Differentiation of Parametric Functions , Differentiation by Trigonometric Transformations , Differentiation of a Function w.r.t. Another Function , Second Order Derivative

Applications of Differential Calculus: Tangents and Normals , Angle of Intersection between two Curves , Derivative as a Rate Measurer , Maxima and Minima of Function with one Variable

**Unit-III:**

Integral Calculus: General Introduction of Integral Calculus , Integration of Sum and difference of Functions , Integration by Simplification , Integration by Substitution , Integration by Parts , Integration of Rational and Irrational Functions ,Integration of Trigonometric Functions , Definite Integral and its Properties

**Unit IV:**

Differential Equations: Definition of differential Equation, Order, Degree and Solution of a differential Equation, Solution of a differential Equation of First Order and First Degree using: Variable Separable

Method , Homogenous Form , Reducible to Homogenous Form , Linear differential Equation , Bernoulli's Equation , Exact differential Equation .

**Unit V**:

Solution of Linear Differential Equation of Higher order with Constant Coefficients, Vector Algebra: Definition, Addition and Subtraction of Vectors , Scalar and Vector Product of two Vectors , Scalar Triple Product and Vector Triple Product , Applications of Vectors in Engineering Problems

REFERECE BOOKS : 1. Mathematics XI & XII NCERT, New Delhi 2. Mathematics XI & XII Rajasthan Board, Ajmer 3. Polytechnic Mathematics H. K. Dass 4. Text Book on Differential Calculus Chandrika Prasad 5. Text Book on Integral Calculus Chandrika Prasad 6. Differential Calculus M. Ray, S. S. Seth, & G. C. Sharma 7. Integral Calculus M. Ray, S. S. Seth, & G. C. Sharma

## DIP205 : ENVIRONMENTAL SCIENCE

**Unit-1 Ecosystem: concepts and functions**

Ecosystem- Definition and Introduction of Ecosystem- Abiotic and Biotic components, types of Ecosystems, Food chain, Food web, Ecological pyramids, Energy flow in Ecosystem. Types values, threats and conservation methods of biodiversity.

**Unit -2 Environmental Pollutions and Disaster management**

Causes, Effects and Control measures of: Air pollution, Water pollution, Noise pollution,

Disaster management: Floods, earthquake, cyclone and landslides.

**Unit- 3 Solid Waste Management**

Introduction, Classification of solid waste, Composition and characteristics of solid waste, collection, conveyance and disposal methods of solid waste, Reuse, Recycle and Recovery of waste.

**Unit -4 Non-conventional Energy sources**

Introduction, Renewable Sources of Energy: Solar energy, wind energy, Energy from ocean, energy from biomass, geothermal energy and Nuclear Energy.

**Unit-5 Social Issues and Environment**

Sustainable development, urban problems related to energy, water shed management and Rain water harvesting, Environmental Education and Public awareness. Environment Protection Act- 1986, Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest conservation Act.

**Recommended Reference Books:**

1. Brunner R.C., Hazardous Waste Incineration, McGraw Hill Inc. 1989.

2. Clark R.S., Marine Pollution, Clanderson Press Oxford (TB).

3. Cunningham, W.P, Cooper, T.H. Gorhani, E & Hepworth, M.T. , Environmental Encycolopedia, Jaico Publishing House, Mubmbi, 2001.

4. De. A.K., Environmental Chemistry, Wiley Eastern Ltd.

5. Agarwal, K.C. 2001 Environmental Biology, Nidhi Publ. Ltd. Bikaner.

6. Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut.

7. Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p.

8. Shikha Agarwal and Suresh Sahu, Environmental Engineering, Dhanpat rai and co. (P) LTD. 2009.

## DIP206 : APPLIED PHYSICS LABORATORY-II

**List of Experiments:**

1. To study of least count, error analysis and curve fitting.
2. To determine the value of ‘g’ with help of Compound Pendulum.
3. To study Zener diode as a constant voltage regulator

4. To Study the inverse square law using photocell.
5. To determine the numerical aperture of optical fiber.
6. To study the charging of a condenser.
7. To study the discharging of a condenser.
8. To determine the Planck's constant using LED.
9. Study of the variation of magnetic field at the center of coil when radius remains constant and current vary fitted with the compass box.

## DIP207: ENGLISH & COMMUNICATION SKILLS LAB

**Topics to be covered:**

1. Introducing yourself.

2. Role Plays.

3. Words often mis-spelt and Mis- Pronounced.

4. One word for many.

5. Synonyms and Antonyms.

6. Seminar Presentation.

7. Group Discussion.

8. Job Interview.

## DIP208 : BASIC WORKSHOP PRACTICE - II

**FITTING SHOP**

1. Finishing of two sides of a square piece by filing and to cut a Square notch using hacksaw.

2. To drill three holes and Tapping on the given specimen.

**WELDING SHOP**

3. To prepare Lap Joint with the help of Arc welding

4. To prepare Butt Joint with the help of arc Welding

5. Gas welding practice by students on mild steel flat

**MACHINE SHOP PRACTICE**

6 Job on lathe M/C with centering

7. Job on lathe M/C with step turning

8. Job on lathe M/C with grooving.

9. Study of Shaper M/C.

## DIP209: Social Outreach, Discipline & Extra Curricular Activities

This course aims to cultivate self-confidence, leadership, and community responsibility. It influences academic and personal development, fostering civic responsibility. Students grasp the value of social work and discipline's significance. They contribute to social up-gradation through engagement in organizations, blood donation, awareness programs, and personality development initiatives.

## SEMESTER III

| Theory Papers | | No. of Teaching hours | | | Marks Allocation | | | |
|---|---|---|---|---|---|---|---|---|
| **Code** | **Subject/paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIPCS301 | Programming & Problem Solving Through 'C' | 4 | - | - | 30 | 70 | 100 | 4 |
| DIPCS302 | Computer System Architecture | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS303 | Operating System Principles | 3 | 1 | - | 30 | 70 | 100 | 4 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DIPCS304 | Internet and Web Technologies | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS305 | Basics of Digital Electronics | 3 | 1 | - | 30 | 70 | 100 | 4 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |
| DIPCS306 | C Programming Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS307 | Internet & Web Technology Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS308 | Digital Electronics Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS309 | Social Outreach, Discipline & Extra Curricular Activities | - | - | - | 50 | - | 50 | 1 |
| **Total** | | **16** | **04** | **06** | **290** | **410** | **700** | **24** |

## DIPCS 301: PROGRAMMING AND PROBLEM SOLVING THROUGH 'C'

**Course Objective:**

- Learn essential knowledge on the need of programming languages and problem solving

techniques Using C language.

- It facilitates the student to develop programming capability to design programs as well as real life applications using C language
- Learn effective usage of arrays, structures, functions, pointers and to implement the memory management concepts.
- Analyze and find the solution of computer specific problems.

**UNIT 1**.

**Introduction :** Scope of 'C' Language, Distinction and similarities with other HLLs, Special features and Application areas.

**Elements of 'C' :** Character set, Key words, Data types, Constants and Variables, Operators: unary, binary, ternary Operator precedence.

**UNIT 2.**

**Console Input-Output :**

Types of I-O, Console I-O, Unformatted console I-O: getchar(),putchar(), gets(), puts(),getch(),getche(), Formatted I-O: scanf(), printf()

**Control Flow :**Statements and blocks – if, switch, Loops: for, while, do-while, goto and labels, break, continue, exit, Nesting control statements

**UNIT 3**.

**Arrays :** Basic concepts, Memory representation, One dimensional array, Two dimensional array, Three dimensional array.

**Functions :** Basic concepts, Declaration and prototypes, Calling, Arguments, Scope rules, Recursion, Storage classes types, Library of functions: math, string, system

**UNIT 4.**

**Pointers :** Basic concepts, &, * operator, Pointer expression: assignment, arithmetic, comparison, Dynamic memory allocation, Pointer v/s Arrays, Array of pointers, Pointer v/s Functions,

**Structure, Union and Enumerated Data Types :** Basic concepts, Declaration and memory map, Elements of structures, Structure v/s array, Structure v/s function, Union, Enumerated data types : typedef, enum, Self-referential structures, Low Level Bitwise Operators: & , | , ^

**UNIT 5.**

**File Handling :** Types of files, File organization, Opening, reading, writing, closing, Text and binary file.

**Numerical Methods :** Numerical Integration: Simpson's 1/3 rule, Simpson's 3/8 rule, Matrix Operation, Matrix Inverse by Gauss – Elimination Method, Matrix Inverse by Gauss – Jordan Method, Matrix Addition, Subtraction, Multiplication

**REFERENCE BOOKS :**

1. Application Programming in C R.S. Salaria, Khanna Pub. House.
2. Programming with 'C' Schaum's Series, TMH
3. 'C' Programming E.Balguru Swami, TMH
4. 'C' Programming Kernighan & Ritchie, TMH

5. Let us 'C' Yashwant Kanetkar, BPB
6. Computer Oriented Numerical Method R.S. Salaria, Khanna Pub. House.

**COURSE OUTCOMES OF PROGRAMMING AND PROBLEM SOLVING THROUGH 'C'**

**At the end of the course, the student will be able to**:

CO1: Understand the basic terminology used in computer programming

CO2: Knowladge of console I/O. Design programs involving decision structures, loops and functions.

CO3: Explain the difference between call by value and call by reference And scope of the variables.

CO4: Understand the dynamics of memory by the use of pointers and Different data structures.

CO5: Use different Numerical methods/update basic data files

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

# DIPCS302 COMPUTER SYSTEM ARCHITECTURE

**Course Objective:**

- Understanding of the basic structure and operation of a digital computer.
- Discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication &division.
- Study the different ways of communicating with I/O devices and standard I/O interfaces.

**UNIT 1**.

**Overview of Computer Organization:** Evolution of computer, Von Neumann architecture, Computer generations, Microprocessors and micro-computers design methodology

**Register and Micro -Operations:** Register, Register transfer, Arithmetic micro operations, Logic micro operations, Shift micro operations, Control functions.

**UNIT 2.**

**Basic Computer Organization :** Instruction codes, Computer Instructions, Timing and Control, Execution of instructions, I/O and interrupt,

**Central Processor Organization :** Processor Bus organization, ALU : Simple and floating point, Stack Organisation, Instruction formats modes, Addressing schemes, Data transfer and manipulation, Program control.

**UNIT 3:**

**Arithmetic Processor Organization :** Comparison and subtraction of unsigned binary numbers, Addition and subtraction Algorithm, Multiplication and division Algorithms, Floating point operations.

**UNIT 4.**

**Input / Output Organization :** Peripheral devices, I/O processors, DMA, Interrupt handling, Data communication, Multiprocessor organizations,

**Memory Organization:** Concept of primary and secondary memory, Memory hierarchy, Cache memory, Associative memory (CAM), Virtual memory concept, Memory management unit

**UNIT 5 .**

**Introduction to Parallel Processing:** Flynn's Classification, Pipelining, Vector Processor, Parallel Processors.

**REFERENCE BOOKS:**


1. Computer System Architecture Morris Mano, PHI
2. Structured Computer Organization Tanenbaum (PHI)
3. Computer Organization and Architecture Stallings (PHI)
4. Computer Architecture and Organisation John P. Hayes
5. Advanced Computer Architecture Rajeev Chopra, Vikas Pub. House
6. Computer Organization and Design Pal Choudhary (PHI)
7. Introduction to Digital Computer Design V. Rajaraman

**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1:Understand the major components of a computer including CPU, memory, I/O and storage.

CO2: Students will understand the organization of the CPU.

CO3: Understand Arithmetic Processor Organization.

CO4: Understand the input, output and Memory organization.

CO5: Students will understand the vector and parallel processor.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

## DIPCS303 OPERATING SYSTEM PRINCIPLES

**Course Objective:**

- This course has theory component to teach you the concepts and principles that underlie modern operating systems.
- In this component, Student will learn about processes and processor management, concurrency and synchronization, memory management schemes, file system and secondary storage management, security and protection, etc.

**UNIT 1.**

**Introduction :** What is an operating System, Mainframe, Desktop & Multi processor, Distributed System, Real time Systems, Operating System Services,

**UNIT 2.**

**Process Management and CPU Scheduling :** Process Concept, Process Scheduling, Concept of Threads & Multithreading, Basic Complets – CPU/IU burst, CPU Scheduler, Premptine scheduling dispatcher, Scheduling Criterions, Scheduling Algos : FCFS, SJF, Priority, Round Robin

**UNIT 3.**

**Deadlocks :** What is Deadlock ? Necessary Conditions for deadlock, Resource allocation graph, Deadlock prevention, Deadlock avoidance – Banker's Algo., Deadlock Detection wait for graph and detection algorithm, Deadlock recovery

**Memory Management:** Structure of computer memory, Logical verses physical address space, Contiguous memory allocation and Fragmentation, Concept of Paging: Basic method & h/w support, Concept of segmentation: Basic Method & h/w support,

**UNIT 4.**

**Virtual Memory:** Concept of Virtual memory, Concept of Demand Paging, Page replacement Algorithms: FIFO, Optimal, LRU, Allocation Algorithms: equal & proportional allocation, Thrashing: Cause and Solution (working set model)

**UNIT 5.**

**File System:** File concept, File Attributes, File Operations, File Types, File Access: Sequential and Direct, Allocation Methods: Contiguous Allocation, Linked Allocation, Indexed Allocation.

**Distributed Operating System (DOS):** Introduction, Hardware Concept: Multiprocessor and Multicomputer Systems, Software Concept: Network File System (NFS), Network Operating System (NOS) verses DOS, Design Issues: Transparency, Flexibility, Reliability, Performance, Scalability

**REFERENCE BOOKS :**

1. Operating System Silber Schaltz, Galvin, Gagne , Wiley Pub.
2. Operating System Tannenbaum.
3. Operating System Godebole
4. Operating System Stallings
5. Distributed Operating System Tannenbaum

**COURSE OUTCOMES**

CO1: Understand the basic working process of an operating system.

CO2: Understand the importance of process and scheduling.

CO3: Understand the deadlock detection and recovery techniques.

CO4: Understand the issues in synchronization and memory management.

CO4: Understand the Files system and Distributted Operating System.

**Table : Mapping of Course Outcomes with Program Outcomes**

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

## DIPCS304 INTERNET AND WEB TECHNOLOGIES

**Course Objective**:

- This course is designed to make the students aware of the web development standards and technologies, and to make them ready for designing and developing the web applications.
- At the completion of this course the students will be able to attain good job in web development sector.

**UNIT 1.**

**Internet Basics :** Concept, Establishing Connectivity on Internet, Email: POP, SMTP, www, File Transfer, Telnet, IP Address, Brief overview of TCP/IP

**HTML :** File Creation, Web Server, Web Client, Introduction to HTML, HTML Tags, Structure of HTML Programs, Heading, Titles and Footers, Text Formatting, Text Styles, Text Effects, Color and Backgrounds, Lists, Adding Graphics, Tables, Linking Documents, Frames.

**UNIT 2.**

**Java Script :** Java script in web pages, Advantages of JavaScript, Writing JavaScript into HTML, Programming - Data types and Literals, Type casting, Variables, Arrays, Operators and Expressions, Conditional and Iterative Loops, Functions, Dialog Boxes, Cookies.

**UNIT 3**

**DHTML :** Introduction to DHTML, Cascading Style sheets (CSS), Font Attributes- Color, Background, Text and Border, List Attributes, Class, The <SPAN>….</SPAN> Tag, Java Script Style Sheet, The <DIV>…..</DIV>Tag,

**UNIT 4.**

**CGI:** Use of CGI, Working of CGI, Methods of Data Submission (GET and POST), Environment Variables, Process Form Information in CGI Program.

**UNIT 5.**

**Perl :** Basics of Perl, Strings, Scalar variables, Arrays, Hash Array, Arithmetic and Comparison Operators, Control Program Flow, Functions: String, Array, Mathematical and Time, File Handling, STDIN & STDOUT, Concept of Files and Directories, Open and Close Files, Reading and Writing Files

**REFERENCE BOOKS :**

1. Web Enabled Commercial Application Development Using HTML, DHTML, Java Script Ivan Bayross, BPB
2. Internet and Web Technology Xavier, TMH
3. Web 101, Making the Network for you Wendy Lehnert, PEA
4. Java Script Flamange, (ORA/SPD)
5. Dynamic HTML Goodman, (ORA/SPD)

**COURSE OUTCOMES**

CO1: Understand the basics of internet and Working with HTML.

CO2: Understand the Java scripting.

CO3: DHTML Concept and working.

CO4: Understand the issues CGI.

CO4: Working with pearl language.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

## DIPCS305 BASICS OF DIGITAL ELECTRONICS

**UNIT 1**

**Introduction :** Digital signal and its representation, Advantages of digital techniques,

**Number System :** Decimal, binary, octal and hexa-decimal number system, Conversion of a number from one system to another system, Binary addition, subtraction and multiplication, Representation of positive and negative numbers, 1's complement and 2's complement, Subtraction using 2's complement, Parity bit, Binary codes (Gray, Excess -3, Hamming codes), ASCII code, Floating point number

**UNIT 2.**

**Logic Gates & Families :** Introduction, Symbol and truth table of NOT, AND, OR, NAND, NOR, EX-OR and EX-NOR gates, Universal gates, Positve, negative and tristate logic, Classification of digital ICs. Characteristics of digital ICs.

**Boolean Algebra:** Historical review - logical statements, logical constants and variables, truth table, Boolean operators, Postulates of Boolean algebra, Laws of Boolean algebra, Duality theorem, De' Morgan's theorem, Simplification of Boolean expressions, Verification of Boolean expressions using truth table

**UNIT 3.**

**Minimization Techniques ( K-Mapping) :** Representation of Boolean expression - min. and max. Term SOP, POS, Conversion of truth tables in POS and SOP form, Karnaugh map upto 4 variables - implication of logic function with and without don't care conditions, Realization of logic diagrams using NAND/NAND, NOR/NOR gate,

**UNIT 4.**

**Combinational Logic Design :** Binary half and full adder, Binary half and full subtractor, Binary serial, parallel and BCD adder, Parity bit generator and checker, Binary comparator, Multiplexer, 4 to 1 multiplexer, 16 to 1 multiplexer, Demultiplexer, 1 to 4 Demultiplexer, 1 to 16 Demultiplexer, Encoder, Decimal to BCD, Decoder , BCD to Decimal, BCD to seven segment

**UNIT 5.**

**Sequential Systems:** Introduction, Symbol, logic circuit, truth table of R-S, J-K, M/S J-K,D,T flip-flops, Edge and level triggering, Shift registers,- Left, right and bi-direction, Series and parallel, Universal shift register, Asynchronous and synchronous counters - up, down and up-down, Mod counters - Mod 5, Mod 9, decade counter, Ring counters, Johnson counter, Programmable counters, Use of shift register for simple binary multiplication and division.

**REFERENCE BOOKS :**


1. Digital Principles & Applications Malvino Leach., TMH
2. Integrated Electronics Millman & Halkias, M. Hill
3. Digital Electronics T.C. Bartee
4. Digital Electronics Practice Using IC's R.P. Jain. TMH
5. Modern Digital Electronics R.P. Jain,TMH
6. Digital Circuit & Design S. Salivahanan, Vikash Pub.
7. Digital Intregrated Circuit K.R. Botker
8. Digital Design Flloyd
9. Digital Logic Design Morris Mano., PHI


## DIPCS 306: PROGRAMMING AND PROBLEM SOLVING THROUGH 'C' LAB

1. Problems based on arithmetic expression, fixed mode arithmetic
2. Problems based on conditional statements and control structures.
3. Problems based on arrays (1-D, 2-D), functions, pointers, files
4. Problems based on string and character manipulation.
5. Problems based on Numerical Methods using 'C' language

## DIPCS307 : INTERNET AND WEB TECHNOLOGIES LAB

1. Installation of Web server and Web browser
2. Practice for creating web pages/sites using HTML
3. Practice for creating web pages/sites using JavaScript
4. Practice for creating web pages/sites using DHTML
5. Practice for creating web pages/sites using CGI
6. Practice for creating web pages/sites using Perl

## DIPCS308 : BASICS OF DIGITAL ELECTRONICS LAB

1. Verify the truth tables of NOT, AND, OR, NAND, NOR, EX-OR, EX-NOR gates
2. Design a NOT, AND, OR, EX-OR, EX-NOR gates using universal gates
3. Design a binary half and full adder
4. Design a binary half and full subtractor
5. Study of BCD to 7 segment decoder
6. Verify the truth table of RS, D, J-K, M/S J-K,D,T flip-flops.
7. Study of asynchronous binary ripple up, down and up-down and different mod counters
8. Study of synchronous counters
9. Study of decade counter
11. Study of programmable counter
12. Study of a shift register using flip flops
13. Study of ring counter using flip flops

## DIPCS309: Social Outreach, Discipline & Extra Curricular Activities

This course aims to cultivate self-confidence, leadership, and community responsibility. It influences academic and personal development, fostering civic responsibility. Students grasp the value of social work and discipline's significance. They contribute to social up-gradation through engagement in organizations, blood donation, awareness programs, and personality development initiatives.

## SEMESTER IV

| Theory Papers | | No. of Teaching hours | | | Marks Allocation | | | |
|---|---|---|---|---|---|---|---|---|
| **Code** | **Subject/paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIPCS401 | Data Communication | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS402 | Data Base Management System | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS403 | Data Structure & Algorithm | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS404 | Microprocessor and Interfacing | 3 | - | - | 30 | 70 | 100 | 3 |
| DIPCS405 | PC Maintenance and Trouble Shooting | 3 | 1 | - | 30 | 70 | 100 | 4 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |
| DIPCS406 | DBMS Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS407 | DSA Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS408 | Microprocessor and Interfacing Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS409 | PC Maintenance and Trouble Shooting Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS410 | Social Outreach, Discipline & Extra Curricular Activities | - | - | - | 50 | - | 50 | 1 |
| **Total** | | **15** | **04** | **08** | **220** | **430** | **750** | **24** |

## DIPCS401 DATA COMMUNICATION

**Course Objectives:**

- **1.**Explain the importance of data communications and the Internet in supporting business communications and daily activities; explain how communication works in data networks and the Internet.
- Explain the role of protocols in networking and analyze the services and features of the various layers of data networks
- Recognize the different internet working devices and their functions.

**UNIT 1**

**Introduction :** Data Communication : Model and Components, Computer Networks, Line Configurations, Topology, Transmission modes, Communication Protocol: Layered Architecture, Reference Models : OSI and TCP/IP

**UNIT 2.**

**Signals and Transmission :** Analog and Digital Forms, Analog Signals : Amplitude, Period and Frequency, Phase, Spectrum and bandwidth, Digital Signals : Bit Interval and Bit Rate, Digital Data Transmission : Parallel and Serial, Asynchronous and Synchronous, Modems .

**UNIT 3.**

**Multiplexing and Communication Hardware :** FDM and TDM, Transmission Media: Guided & Unguided media, Performance factors, Network devices: Repeaters, Bridges, Switches, Routers and Gateways

**UNIT 4.**

**Data Link Layer :** Introduction, Flow control & Error control, Types of errors : Single bit & burst errors, Error Detection & Correction, VRC, LRC, CRC, Checksum, Hamming Code, Flow control & error control protocols : Stop & Wait 2 Sliding window, ARQ, HDLC, Local Area Networks : Introduction to Ethernet, Token bus, Token Ring & FDDI.

**UNIT 5.**

**Switching and Frame Relay :** Circuit Switching, Packet Switching : Datagram & Virtual Circuit approach, Introduction to Frame relay : Its role, advantages & disadvantages. Frame relay operation, Congestion Control : BECN, FECN, Leaky Bucket Algorithm.

**REFERENCES BOOKS :**

1. Data Communications & Networking Behrouz A. Forouzan, TMH
2. Data & Computer Communication William Stallings, PHI
3. Data Communication & Computer N/W Sanjay Pahuja, Std. Publication
4. Data Communication and Networks Godbole, TMH

**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1:Understand concepts of Data Communication Model and Components

CO2: Understand types of Signals and Transmission .

CO3: Working with Multiplexing and Communication Hardware.

CO4: Understand the Data Link Layer concepts.

CO5: Perform Switching and Frame Relay.

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

## DIPCS402 DATA BASE MANAGEMENT SYSTEM

**Course Objectives:**

- Provide introduction of basic database concepts, including the structure and operation of the relational data model.
- Descibe the feature and the role of database management system in an organization.
- Construct simple and moderately advanced database queries using, Structured Query Language (SQL).
- Understand and successfully apply logical database design principles, including E-R diagrams and database normalization.

**UNIT 1.**

**An overview of database management system**, Need for DBMS, Components of DBMS, Applications of DBMS, Advantage of DBMS, Database system versus file system, Disadvantages of DBMS, Database System Concepts and Architecture, Application Architecture of DBMS- Two-Tier Architecture, Three-Tier Architecture

Database Models, Hierarchical Database Model, Network Database Model, Relational Database Model, Object-Oriented Database Model, Schema and Instances, Data Independence, Physical Data Independence, Logical Data Independence, Database Language and Interface, Overall Database Structure

**UNIT 2.**

**Data Modeling Using the E-R Model :** E-R Model concepts, Notations of E-R Diagram, Mapping Constraints, One-to-one, One-to-Many, Many-to-One, Many-to-many, Keys, Super key, Candidate Key, Primary key, Composite key, Foreign key, Alternate key, Secondary key, Examples of E-R Diagrams

**UNIT 3.**

**Relational Data Model and Language :** Introduction. Properties of Relational Tables. Differences between DBMS and RDBMS, Codd's Rules of RDBMS, Integrity Constraints, Entity Integrity Constraints, Referential Integrity Constraints, Domain Integrity Constraits, Query Language, Relational Algebra, Relational Calculus

**Normalization :** Normalization Concepts, Functional Dependencies, Lossless/Lossy Join Decomposition, Normal Forms, First Normal Form (1NF), Second Normal Form (2NF), Third Normal Form (3NF), Boyce-Codd Normal Form (BCNF), Multi-valued Dependency & Fourth normal Form, Join Dependency and Fifth Normal Form.

**UNIT 4.**

**Transaction Processing Concepts :** Transaction System, Properties of Transaction- Atomicity, Consistency, Isolation, Transaction States, Transaction Processing System, Recovery from Transaction Failures, Cascading Rollback, Recoverable Schedule, Log Based Recovery, Check Points, Backup Mechanism, Shadow Paging, Distributed Database, Homogeneous Distributed Database, Heterogeneous Distributed Database, The major Advantages of Distributed DBMS (DDBMS)

**UNIT 5**

**Deadlock Handling :** Introduction, Deadlock Detection, Recovery from Deadlock, Concurrency Control Techniques : Concurrency Control, Locking Techniques for Concurrency Control, Mode of Locking, Shared Lock ,Exclusive Lock, The Two-phase Locking Protocol, Static (or Conservative) Two-phase Locking, Dynamic Two-phase Locking, Strict Two-phase Locking, Time Stamping Protocol for Concurrency Control

**REFERENCES BOOKS :**

1. Database management System P.K. Yadav, S.K. Kataria & Sons, Delhi
2. An Introduction to Database System Bipin C. Desai, Galgotia Publications
3. Fundamentals of Database Systems R. Elmastri, S.B. Navathe, Pearson Education
4. An Introduction to Database management System (A-level) Satish jain, BPB Publication
5. Database Ssytems: Concepts, Design & Applications" S.K. Singh, Pearson Education

**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1:Understand and explain the underlying concepts of DBMS and its Architecture.

CO2: Data Modeling Using the E-R Model and design a database schema .

CO3: Normalize a database and Populate and query a database using SQL DML/DDL commands.

CO4: Understand the transaction processing concepts.

CO5: Concept concurrency controll and Deadlock Detection and Recovery Techniques.

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

## DIPCS403 DATA STRUCTURE & ALGORITHM

**Coure Objective:**

- To give an overview about how the data organizes and the techniques to organize the data.
- Develop good understanding of how operations are performed on data in various data structures.
- Choose appropriate data structure as applied to specified problem definition, handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
- Student will become familiar with Algorithm analysis: Trees, Graphs, searching and sorting and files.

**UNIT 1**

Introduction to Data Structures and Algorithms : Introduction to data representation , Review of data structures- Array, Pointer, Structure, Lists, Trees, and Graphs,What is an Algorithm , Designing Algorithms , Analyzing Algorithms , Mathematical Notation and Functions , Asymptotic Notation (O,θ,Ω) , Performance Measurement

**UNIT 2**

Algorithm on Linked List : Linear Linked List and Operations , Circular Liked List and Operations , Doubly Linked List and Operations , Applications of Linked list: Polynomial representation, Multiple-Precision Arithmetic

Algorithms on Stack : Representation using array and linked list: Operation and Example , Push and Pop Operation , Representation of expressions: Infix, Postfix, Prefix , Inter conversion of the expressions , Evaluation of the expression , Recursion: Tower of Hanoi, Recursive functions

**UNIT 3**

Algorithms on Queue : 4.1 Representation using array and linked list 4.2 Insertion and Deletion Operation 4.2 Circular Queue 4.3 Double Ended Queue 4.4 Priority Queue 4.5 Multiple Queues

Non-Linear Data Structure: Tree 5.1 General Concept 5.2 Sequential and Linked List Representation of Tree 5.3 Binary Tree 5.4 Conversion of General Trees to Binary Trees 5.5 Binary Tree Traversal Algorithms: Recursive and Non-recursive 5.5.1 Preorder Traversal 5.5.2 Inorder Traversal 5.5.3 Postorder Traversal 5.5.4 Backward Inorder 5.6 Binary Search Tree 5.7 Applications of Trees

**UNIT 4**

Non-Linear Data Structure: Graph : Properties of Graphs , Representation of Graphs , Adjacency Matrix , Adjacency List ,Traversal Algorithms- Depth First Search, Breadth First Search , Minimum Cost Spanning Tree : Prims Algorithm , Kruskal's Algorithm , Shortest Path Algorithms , Dijkastra's Algorithm , Bellman-Ford Algorithm , Warshal Algorithm 6.6 Applications of Graphs

**UNIT 5**

Sorting and Searching Algorithms and their Analysis :Internal and External Sorting , Sorting Problems: Selection sort, Bubble sort, Insertion Sort, Merge sort, Quick Sort, Heap sort , Sequential Search , Binary Search , Hashing: Hashing Functions Collision Resolution Techniques

**REFERECES BOOKS :**


1. A practical approach to Data Structures and Algorithms Sanjay Pahuja, New Age International
2. Data Structure Tenenbaum. TMH
3. Data Structure and Program Design Robert L. Kruse, PHI
4. Data Structure using C Y. Kanitkar, BPB
5. Data Sructure Schaums series, TMH
6. Data Structure and Algorithms Horowith sahani, PHI


**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1:Understand the concept of different Linear and Non- Linear data structures.

CO2: Identify data structures suitable to solve problems

CO3: Develop algorithms for binary trees and graphs.

CO4: Implement sorting and searching algorithms

CO5: I Implement symbol table using hashing techniques.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

**PRACTICAL (Implementation in C language)**

1. Programs based on linked list.
2. Programs based on stacks and queue.
3. Programs based on tree traversal.
4. Programs based on Graphs
5. Programs based on sorting
6. Programs based on searching.

## DIPCS404 MICROPROCESSOR AND INTERFACING

**UNIT 1**

**Introduction :** Microprocessor concept, Historical review of microprocessor development, Organization of a micro computer

**The 8085 Architecture :** Internal block diagram, 8085 signals and their functions, Demultiplexing of buses, Pin configuration and logical diagram.

**UNIT 2.**

**8085 Instructions and Programming :** Instruction format- Mnemonics, Opcode and operand, Instruction length, Classification of instruction - Data transfer, Arithmetic, Logical, Branching, Machine control, Different interrupts of 8085 Microprocessor, Addressing modes, Stack operation and related instructions, Subroutine and related instructions, Machine and assembly language, Assembly language programming, Debugging of programs,

**UNIT 3**

**Memory and I/O System :** Memory types, Memory organization, Basic concept of memory interfacing and I/O interfacing, Difference between peripheral I/O and memory mapped I/O

**UNIT 4.**

**Instruction Execution and Timings:** Instruction cycle - machine cycle, T-states, Fetch cycle, Memory read and writes cycle, I/O read and write cycle, Interrupt acknowledge cycle, Bus idle cycle, DMA

cycle, Machine cycle with wait states. Programs using delays and counters

**UNIT 5.**

**Interfacing With 8085 :** Decoder & Encoder, Memory (RAM & ROM), PPI (8255), PIC (8259), USART (8251), Introduction to x 86 Family (8086) : Segment register, Instruction Pointer, Index Register, Stack pointer, Flags, Programmable Registers (8/16 bit), Even & Odd Addressing Techniques, 20 bit address Generation

**REFERENCE BOOKS:**


1. Microprocessor Architecture, Programming & Application Gaonkar
2. Fundamentals of Microprocessors & MicroComputers B.Ram
3. Assembly Language Programming A.Leventhal, Osborn
4. Theory & Problems of Microprocessor Fundamentals Tokhein
5. Microprocessor & Peripheral Hand book INTEL
6. Computer Architecture & org. J.P Hayes
7. Digital Computer Fundamentals T.C.Bartee
8. An Introduction to Microprocessors A.P.Mathur


## DIPCS405 PC Maintenance and Trouble Shooting

**Course Objective**

- Indroduced with the basic functioning of the computer like instalation, disk organization,manazing devices etc.
- Student able to dignose the issue if occure in the system and truobleshoot the minor issues without interfare of a tecnician.

**UNIT 1.**

**Computer Installation :** Site Preparation, Air-Conditioning Requirements, False-Ceiling and False-flooring, Fire-Protection system, Electrical Earthling, Power Supply Requirements, Clean Power Supply, Power Supply Problems, Power Conditioning, Power Protection equipments-Spike Suppressor, CVT, UPS (Online and Off-line), SMPS

**UNIT 2.**

**Safety and Security Measures :** Safety from Natural calamities, Theft and Fire Hazards, Data Security, Security from unauthorized users, Virus Protection Techniques, Firewalls, Folder Locking

**Working Principles of peripheral devices -** Keyboard: Wired and wireless, Optical Mouse: Wired and Wireless, Scanner, OCR, OMR, MICR and BCR (Bar Code Reader), Printers: Dot-Matrix Printer (DMP), Inkjet Printer, Laser Printer, Modem: Dialup, Wired Broadband, Wireless Broadband, Digital Camera , Web-cam and Microphone (MIC), USB Flash memory (Pen drive)

**UNIT 3.**

**Display Technologies**-Thin Displays, Cathode Ray tube (CRT) Display, Liquid Crystal Display (LCD),

Plasma Display. Optical Storage Devices: Optical Storage Media , CD-Drive-Installation and Operation, Digital Versatile Disc (DVD)-Technology,.

**UNIT 4**

**I/O Ports :** Serial Port, Parallel Port, Game Port, USB Port, HDMI Port

Hard Disk Drive (HDD)- Working Principle, HDD Controller, HDD Interface types: SCSI, IDE, and SATA, USB External Hard disk

**UNIT 5.**

Windows Components and Tools - Windows Registry, Scandisk and Disk Defragmenter, Disk management, File Systems-FAT16, FAT32, and NTFS,

**Memory :** RAM, SDRAM, DDR, ROM

**REFERENCE BOOKS :**

1. Computer Installation and Servicing D Balasubramanian, TMH
2. The Complete Reference PC Hardware Craig Zacker, John Rourke, TMH
3. IBM PC and Clones B. Govidarajalu, TMH
4. The Complete PC Upgrade and Maintenance Guide Mark Minasi, Wiley-India

**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1: Maintain the PC with Safety and Security Measures.

CO2: Understand Working Principles of peripheral devices.

CO3: Understand the working of different Display Technologies**.**

CO4: Identify the uses of different I/O ports.

CO5: Perform disk management.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | M | - | | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | H | H | H | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

## DIPCS406 DBMS LAB

## DIPCS407 DSA LAB

**PRACTICAL (Implementation in C language)**

1. Programs based on linked list.
2. Programs based on stacks and queue.
3. Programs based on tree traversal.
4. Programs based on Graphs
5. Programs based on sorting
6. Programs based on searching.

## DIPCS408 MICROPROCESSOR AND INTERFACING LAB

## DIPCS409 PC MAINTENANCE AND TROUBLE SHOOTING LAB

1. Study and Identify of various parts of a PC
2. Creating Disk Partitions and formatting them.
3. Installation of Windows Operating System.
4. Installation of Linux Operating system.
5. Installation of Operating Systems using VMWARE utility
6. Installation of Network Interface Card (NIC) or LAN card
7. Installation of Local Printer
8. Installation of Network Printer
9. Installation of Scanner
10. Use PING command to verify the TCP/IP connection between two nodes.
11. To login to remote Desktop using TeamViewer utility.
12. To prepare a Straight cable using standard color coding.
13. To prepare a Crossover cable using standard color coding.
14. To connect two PCs using Crossover cable without using a Switch or Router.
15. To use CD writing Software for Copying Files and Disc-to-Disc Copying.

## DIPCS410: Social Outreach, Discipline & Extra Curricular Activities

This course aims to cultivate self-confidence, leadership, and community responsibility. It influences

academic and personal development, fostering civic responsibility. Students grasp the value of social work and discipline's significance. They contribute to social up-gradation through engagement in organizations, blood donation, awareness programs, and personality development initiatives.

## SEMESTER V

| Theory Papers | | No. of Teaching hours | | | Marks Allocation | | | |
|---|---|---|---|---|---|---|---|---|
| **Code** | **Subject/paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIPCS501 | Basics of Electronic Devices and Circuits | 3 | - | - | 30 | 70 | 100 | 3 |
| DIPCS502 | Object Oriented Programming Through C++ | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS503 | Unix, Shell Programming and Administration | 3 | - | - | 30 | 70 | 100 | 3 |
| DIPCS504 | Software Engineering | 3 | - | - | 30 | 70 | 100 | 3 |
| DIPCS505 | Dot Net Technology | 3 | - | - | 30 | 70 | 100 | 4 |
| DIPCS506 | Personality Development Skills | 3 | - | - | 30 | 70 | 100 | 3 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |
| DIPCS507 | EDC Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS508 | OOPS Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS509 | Unix & Shell Programming Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS510 | S.E. Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS511 | .Net Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS512 | Minor Project | - | - | 1 | 30 | 20 | 50 | 1 |
| DIPCS513 | Social Outreach, Discipline & | - | - | - | 50 | - | 50 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Extra Curricular Activities | | | | | | | |
| **Total** | | **18** | **01** | **11** | **410** | **540** | **950** | **27** |

## DIPCS501 BASICS OF ELECTRONIC DEVICES AND CIRCUITS

**UNIT 1.**

Semiconductor and PN Junction : Metal, non metals and semiconductors and their Energy Band Diagram. Intrinsic and Extrinsic Semiconductors. Effect of temperature on extrinsic semiconductor, Energy band diagram of extrinsic semiconductor, Drift and diffusion current, Hall Effect, P-N Junction Diode, Space charge region, Barrier potential and effect of temperature, Energy band diagram, Biasing of diode. V-I characteristics, Static and dynamic resistance, Transition and diffusion capacitance, Zenner and Avalanche breakdown, Working, characteristics and application of 1. Zener diode 2. Varactor diode 3. Photo diode, 4. Light emitting diode (LED), Photo conductors, Cds photo conductive cells and photo voltaic cell.

**UNIT 2.**

Bipolar Junction Transistor (BJT) : Constructional details of PNP and NPN transistors, Working of a transistor- Charge transport phenomenon, Transistor amplifying action, Relation between different currents in a transistor, Simple problems. Configuration of transistor (CB, CE and CC), Behavior of BJT in Active, Cut off and Saturation regions- 1 Transistor as a switch, 2- Transistor as an amplifier, 3. Transistor

**UNIT 3:**

Biasing and Bias Stability : D.C. and A.C. Load line. Operating point and its stability, Factors affecting bias stability, Stability factors, Bias stabilization, Calculation of operating point and stability factor for 1. Fixed Bias Circuit. 2. Collector to base biasing. 3. Voltage Divider biasing (Self bias), Bias Compensation techniques using 1. Diode. 2. Thermistor and Sensistor. Thermal stability and Thermal runaway

**UNIT 4.**

Field Effect Transistor: Construction, operation and characteristics of JFET , E and D MOSFET,
Biasing of FET, Small signal model of JFET, Terminology used with JFET, Precaution for handling of MOSFETs

**UNIT 5.**

Rectifiers : Working of rectifiers, Half wave rectifier, Centre tape full wave rectifier, Bridge rectifier, Analysis of rectifiers (for all type), Calculations for average and RMS values, PIV of diodes, Ripple factor, Regulation and efficiency, Calculation of ripple factor and working of following filters: 1 Capacitance filter, 2. Inductance filter, 3. L-C and $\pi$ (Pie) filters, 4. Voltage Multipliers,

Power Supplies & Sensors : SMPS, UPS, Inverter, Thermocouple, Pressure Gauge, Strain Gauge ,Displacement Sensor (LVDT, RVDT)

**REFERENCE BOOKS :**

1. Electronic Devices & Circuits Millman & Halkias, MH
2. Electronic Devices & Circuits V. K. Mehta, S. Chand
3. Electronic Devices & Circuits A.Mottershed PHI
4. Industrial Electronics A.K. Khatri, CBH, Jaipur
5. Electronic Devices & Circuits Sanjeev Gupta, Dhanpat Rai,
6. Electronic Devices & Circuits Floyd, Pearson Education
7. Electronic Devices & Circuits Boylestad, Pearson Education
8. Electronic Devices & Circuits J.P. Gupta, Kataria & Sons

## DIPCS 502- Object Oriented Programming Through C++

**Course Objectives**

- To familiarize with Programming paradigms
- To introduce the basic concepts of Object Oriented Languages like class, object, data hiding, encapsulation, and abstraction.
- To understand and implement concepts like message passing, inheritance, polymorphism, exception handling and generic programming.

**UNIT 1.**

An Overview of Object Oriented Programming: The need of object oriented programming, Characteristics of OOPs: Objects, Classes, Inheritance, Reusability, New data types, Polymorphism and overloading , Benefits of OOPs,

**UNIT 2**

An overview of C++ Programming ,Data Types, Operators, Manipulators , "cin" and "cout" usages , Statements : Comments, Assignments, if, switch and loops , Functions and its default arguments , Inline functions

**UNIT 3**

Class and its members , Access Specifier : public, private, protected , Static data member and static functions ,Array of objects , Object as function arguments , Constructors and Destructors , Friend function , Copy constructor, Function overloading , Defining operators over loading , Rules of overloading operators , Overloading unary operators , Overloading binary operators , Operator overloading using friend functions

**UNIT 4**

Inheritance: Using public, private and protected access specifiers , Types of inheritance ,Virtual base classes , Virtual and pure virtual functions , Abstract classes , Reusability considerations, Generic

functions ,Generic classes , Basics of exception handling , Exception handling mechanism , Throwing and catching mechanism , Rethrowing an exception

**UNIT 5**

C++ streams and stream classes , Unformatted I/O operations , Formatted console I/O operations , Managing output with manipulators , Classes for file stream operations , Opening and closing a file , File modes and file pointers , Put ( ), get ( ), read ( ), and write ( ) functions

**REFERECE BOOKS :**


1. Programming in C++ E. Balaguruswamy, TMH
2. Oriented Programming TURBO C++ Robert Lafore, Galgotia Pub.
3. The Complete Reference C++ Herbert Schildt, TMH
4. The C++ Programming Language, B. Stroustrup, Addison wesley/Pearson
5. Let us C++ Y. Kanetkar, BPB
6. Object Oriented Programming and C++ R.Rajaram, New Age


**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1:Understand object-oriented programming features in C++.

CO2: Apply these features to program design and implementation.

CO3: Understand object-oriented concepts and how they are supported by C++.

CO4: Apply the facilities offered by C++ for Object-Oriented Programming.

CO5: Understant console operations and file handlling.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

## DIPCS503-Unix, Shell Programming and Administration

**Course Objectives:**

- Learn UNIX architecture.
- Learn different commands to operate this system, file structure of UNIX.
- Know the introduction to Shell Programming and control structure.
- Working of vi editors.

**UNIT 1**

Unix Architecture , Features of UNIX , Command structure and usage, Basics of file , Structure of file systems , File permission , File ownership , Inodes , Partition

**UNIT 2**

File management commands : ls, cat, rm, mv, cp, chmod,cmp,diff, comm , Directory management commands : mkdir, rmdir, cd, pwd , General purpose utilities : more, ps, wc, printf or echo, lp, banner, bc , cal, date, time, who, man, kill

**UNIT 3**

Three modes , Input mode, Adding and replacing text , Saving text and quitting – The ex mode , The repeat factor , Command mode , Using operators in deleting and copying text , Navigation , Pattern search , Joining lines , Undo, Repeating the last command , Moving text from one file to another file , Search and replace

**UNIT 4**

Different types of UNIX shell , Shell interpretive cycle , Command line structure , Meta character, Pattern matching , Escaping , quoting , I/O Redirection , Command arguments and parameters , Command substitution , Shell variables, Shell Script , Dot command , Interactive execution (read) , Command line arguments ($1, $2 etc) , The && and | | operators , Conditional statements : if , case , Loops : for, while, until , Shell function , Interrupt handling (trap)

**UNIT 5**

System Administration jobs , Finding files , Mounting file system , File system checking ,Compressing files . Backing up files (tar, cpio) , User management (add user, modify user ,remove user and change password) , Understanding /etc/passwd, /etc/shadow, /etc/inittab

**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1: To describe and use the UNIX operating system.

CO2: To describe and use the fundamental UNIX system tools and utilities.

CO3: To describe and write shell scripts in order to perform basic shell programming.

CO4: To describe and understand the UNIX file system.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

# DIPCS504-Software Engineering

**Course Objective:**

- Course is intended to help students to develop skills that will enable them to construct software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain.
- Understand the whole process of software development and techniques.
- CASE tools and software development environments.

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**UNIT 1**

Software Engineering evolution and impact , Software Crisis , Program and Software Products , Software Characteristics , Software metrics , Emergence of Software Engineering

**UNIT 2**

Why use life cycle models? 2.2 Waterfall model 2.3 Prototyping Model 2.4 Evolutionary Model 2.5 Spiral Model 2.6 Comparison of different Life Cycle Model, Requirement Gathering Methods and Analysis 3.2 Feasibility Study

**UNIT 3**

Software Requirement Specification (SRS) :Contents of SRS document, Characteristics of good SRS documents , Organization of SRS document , Techniques for representing complex logic: Decision Tree, Decision Table.

Software Design : What is good Software design?,Cohesion and Coupling , Classification of cohesiveness , Classification of coupling . Software Design Approaches: Function Oriented Design ,Object oriented design

**UNIT 4**

Function Oriented Design :Overview of SA/SD Methodology , Structure analysis , Data Flow Diagram (DFD). Primitive Symbols used for constructing DFD, Balancing DFD ,Developing DFD Model of a

system:Context diagram ,Level 1 DFD , Decomposition ,Numbering of Bubbles . Common errors constructing DFD .Shortcomings of DFD model

Data Dictionary , Structure Design: Structure Chart ,Transformation of DFD model into structure chart , Detailed design

**UNIT 5**

Software Testing : What is testing? , Verification v/s Validation , Design of Test Cases , Level of Testing ,Unit Testing Black Box Testing: Equivalence Class Partitioning , Boundary Value Analysis . White Box Testing :Statement, Branch coverage ,Condition, Path coverage , McCabe`s Cyclomatic Complexity Metric , Integration Testing , System Testing

Software Reliability : Hardware v/s Software reliability , Reliability metrics. Software Quality, Software Quality System ,ISO 9000 : What is ISO 9000 for Software industries? , Why and How to get ISO 9000? , ISO 9000 Requirements , Shortcomings of ISO 9000 certification , SEI Capability Maturity Model (SEI CMM) , Six Sigma.

**REFERECE BOOKS:**


1. Fundamental of Software Engineering Rajib Mall, PHI

2. Software Engineering KK Aggarwal, Yogesh Singh New Age International Pub

3. Software Engineering Ian Sommerville Addison Wesley

4. Fundamental of Software Engineering Carlo Ghezzi et al. PHI

5. Software Engineering : A Practitioners approach Roger Pressman, MH

6. An Integrated approach to Software Engineering Pankaj Jalote, Springer


**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1:Understand the importance of the stages in the software life cycle.

CO2: Understand the various process models.

CO3: Understand the importance and organization of SRS.

CO4: Be able to design software by applying the software engineering principles.

CO5: Perform Software testing, documentation and maintenance.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

## DIPCS505- Dot Net Technology

**Course Objective:**

- Get the Knowledge about different Object Oriented Features and to understand disconnected architecture of .Net.
- An understanding of the goals and objectives of the .NET Framework.
- The ability to effectively use visual studio .NET.
- To acquire knowledge on the usage of recent platforms in developing web applications.
- Learn Visual Basic .NET to create window and web application with database connectivity.

**UNIT 1**

Introduction to .NET , Comparison between .NET and Java , Architecture and Advantages of .NET framework , Namespaces , Object Oriented Features , Visual Studio.NET Integrated Development , Elements of IDE , Writing a Simple Application using .NET

Introduction to and Features of VB.NET , Similarities and Differences between Visual Basic and VB.NET , Data types supported in VB.NET , Variables, Scope of Variables, Access Control: Public, Private, Protected, Friend, Protected Friend , Various Operators: Arithmetic, Comparison, Assignment, Logical Operators, Concatenation Operators, Operator Precedence

**UNIT 2**

Programming Concepts of VB.NET : Control Structures: Decision Making Statements, Looping Statements, Other Statements , Arrays: Static, Dynamic Arrays, Array Functions , Procedures and

Functions , Parameter Passing: Pass-by-Value, Pass-by-Reference, Optional and Named Agruments , Predefined Functions: MsgBox(), InputBox(), and other functions.

**UNIT 3**

Object Oriented Features of VB.NET : Introduction to OOP Features: Class, Objects, Overloading, Overriding, Structure , Structure: Similarities and Differences with Class , Overloading the Methods , Shared Members ,Inheritance , Abstract Base Class , Interfaces: Differences between Interface and Class

Windows FORMS and Controls:Introduction,Windows Forms: Properties and Methods, Events, MDI Forms , Properties and Methods Controls: Label, TextBox, LinkLabel, Button, Radio Button, CheckBox, ListBox, ComboBox, Timer control, Scroll bars, Menus , Exception Handling

**UNIT 4**

Database Connectivity using ADO.NET : Evolution and Features of ADO.NET , ADO versus ADO.NET ,ADO.NET Object Model , Overview of Data Provider, Provider Objects: Connection, Command, Data Adapter, Data Reader , Overview of DataSet, Types of DataSets , Data Object Model and Data Object Model , Namespaces in ADO.NET , Using Command Objects , Data Binding : Simple Binding, Complex Binding

**UNIT 5**

ASP.NET : Introduction , Differences and Similarities between ASP and ASP.NET , Characteristics of ASP.NET , Architecture of ASP.NET , Server Controls , HTML Server Controls , Types of Web Controls ,Working with Web Controls & their Properties , Validation Web Server Control , ASP.NET Event Handling , User Controls ,Data Access through ASP.NET . Session and Application Objects in ASP.NET , Cookies: properties and limitations.

**REFERECES BOOKS** :

1. Essentials of .NET Programming, C. Komalavalli, Sanjib K Sahu, Ane Books Pvt. Ltd., New Delhi
2. Visual Basic.NET, Shirish Chavan, Pearson Education, New Delhi

3. Introduction to Visual Basic.NET, NIIT (PHI)

4. ASP.NET and VB.NET Web Programming, Matt J. Crouch , Pearson Education, New Delhi

5. Programming VB.NET, Cornell, Gary, IDG

**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1:Understand the Architecture of .NET Framework.

CO2: Understand the Programming Concepts of VB.NET.

CO3: Understand the Object Oriented Features of VB.NET and working with Window forms.

CO4: Establish Database Connectivity using ADO.NET

CO5: Understand the development of Web applications with ASP.NET.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | - | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | - | - | M |
| CO3 | L | H | L | M | M | - | - | - | H | - | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | - | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

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**DIPCS507 EDC LAB**

**DIPCS508 OOPS LAB**

1. Practice for Classes and Object Creation
2. Practice for constructors and deconstructors creation
3. Practice for static and friend functions for a class.
4. Practice for Function overloading

5. Practice for Operator overloading

6. Practice for Copy constructor

7. Practice for inheritance

8. Practice for virtual function

9. Practice for exception handling template

10. Practice for read( ) and write( )

**DIPCS509 Unix & Shell Programming Lab LAB**

**Note : Following practicals are perform by using UNIX / LINUX operating system.**

1. Installing UNIX/LINUX operating system
2. Practice for login, logout, and shutdown operations
3. Practice for Unix commands
4. Practice for vi editor
5. Practice for shell programs using conditional, looping instructions and shell features
6. Practice for finding files
7. Practice for user management
8. Practice for file system checking
9. Practice for Compressing file
10. Practice for user authentication and access rights

**DIPCS510 SE LAB**

**DIPCS511 .NET LAB**

1. Practice programs on VB.NET using variables and operators.

2. Practice programs on VB.NET using conditional and control structures.

3. Practice programs on VB.NET using Arrays.

4. Practice programs on VB.NET using Inheritance property.

5. Practice programs on VB.NET using Forms and Controls.

6. Practice programs on Database connectivity using ADO.NET.

7. Practice programs on Data Access through ASP.NET

8. Practice programs on ASP.NET using web controls.

9. Practice programs on ASP.NET using Event-handling.

10. Practice programs on ASP.NET using Cookies.

**DIPCS512 MINOR PROJECT**

## DIPCS513: Social Outreach, Discipline & Extra Curricular Activities

This course aims to cultivate self-confidence, leadership, and community responsibility. It influences academic and personal development, fostering civic responsibility. Students grasp the value of social work and discipline's significance. They contribute to social up-gradation through engagement in organizations, blood donation, awareness programs, and personality development initiatives.

**SEMESTER VI**

| **Theory Papers** | | **No. of Teaching hours** | | | **Marks Allocation** | | | |
|---|---|---|---|---|---|---|---|---|
| **Code** | **Subject/paper** | **L** | **T** | **P** | **IA** | **EA** | **Total** | **Credits** |
| DIPCS601 | Computer Network | 3 | 1 | - | 30 | 70 | 100 | 3 |
| DIPCS602 | Data warehouse and mining | 4 | - | - | 30 | 70 | 100 | 4 |
| DIPCS603 | Introduction to Network Security and Cryptography | 3 | 1 | - | 30 | 70 | 100 | 3 |
| DIPCS604 | Java Tools | 3 | 1 | - | 30 | 70 | 100 | 3 |
| DIPCS605 | PHP & MySql | 3 | 1 | - | 30 | 70 | 100 | 4 |
| DIPCS606 | GD & PI | 3 | - | - | 30 | 70 | 100 | 3 |
| ***PRACTICALS/VIVA-VOCE*** | | **No. of Teaching Hours** | | | **Sessional** | **Practical** | **Total** | **Credits** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DIPCS607 | Core Java Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS608 | Core PHP Lab | - | - | 2 | 30 | 20 | 50 | 1 |
| DIPCS609 | Major Project | - | - | 2 | 90 | 60 | 150 | 3 |
| DIPCS610 | Project cum Seminar | - | - | 1 | 30 | 20 | 500 | 1 |
| DIPCS611 | Social Outreach, Discipline & Extra Curricular Activities | - | - | - | 50 | - | 50 | 1 |
| **Total** | | **19** | **04** | **07** | **410** | **540** | **950** | **27** |

## DIPCS601:Computer Network

**Course Objective**:

- The Objective of this subject is to provide the Fundamental Knowledge of Computer Networks and to provide the knowledge of some recent trends in Computer Networks.
- Analyze the services and features of the various layers of data networks.

**UNIT 1**

Data Link Layer and Local Area Networks : Data Link Layer Design Issues:Framing, Error Detection and Correcting Code , Error Control . LAN Protocols: Ethernet and IEEE 802.3 Standard CSMA/CD , IEEE 802.5 LAN Token Ring. PPP : Point to Point Protocol , FDDI : Fiber Distributed Data Interconnect. , Network Layer Design Issues : Routing Algorithms , Shortest Path Routing , Flooding , Distance Vector Routing , Hierarchical Routing , Multicast Routing

**UNIT 2**

Internet Protocol : IPv4 Header ,IPv4 Address , Subnetting , Internet Control Protocols, IPv6 : IPv6 Header , IPv6 Extension Headers , IPv6 Addresses , Routers

**UNIT 3**

Transport Layer : Transport Layer Services , Transport Protocol Mechanisms:Addressing , Multiplexing , Establishment a Connection , Releasing a Connection , Reliable Delivery , Flow Control and Buffering , Connectionless Transport Protocol : UDP ,Connection - Oriented Transport Protocol : TCP , TCP Header format , TCP Connection Management , TCP Congestion Control , TCP Timer Management

**UNIT 4**

Application Layer : Principles of Application Layer Protocols , Domain Name System: DNS , The File transfer Protocol : FTP , Electronics Mail in the Internet : POP, HTTP, IMAP , WWW and HTTP , Network Management SNMP

**UNIT 5**

Wireless Networking : Wireless LANs , IEEE 802.11 , BlueTooth , WiMAX IEEE 802.16 , Building a Network

**REFERECES BOOKS :**

1. Data Communication and Computer Networks Sanjay Pahuja Standard Publishers

2. Data Communication and Computer Networks B. Froujan TMH

3. Computer Networks Andrew S. Tanenbaum, PHI

4. Computer Networks Peterson & Davie

5. Wireless Communications W. Stallings PHI

6. Computer Networks Black, PH

**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1:Understand the Data Link Layer and Local Area Networks

CO2: Understand the Internet Protocol.

CO3: Understand the Transport Layer Application Layer.

CO4: Understand the concept of a wireless network.

CO5: build a network.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | L | H | L | M | M | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | L | M - | |
| CO3 | | L | L | M | L | L | - | - | H | M | - | M |
| CO4 | M | H | - | L | M | - | - | - | M | H | - | M |
| CO5 | - | M | L | L | M | L | L | L | L | - | - | L |

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## DIPCS602: Data warehouse and mining

**Course Objective:**

- Data warehouse is used to manage the old data and mining is used for finding the appropriate information for decision making. The course provides knowledge of Data warehousing and Data mining

**UNIT 1**

Data Mining : Introduction to Data Mining , How Data Mining Works , Data Mining Tasks , Data Mining Elements , Data Mining Architecture , Advantages & Disadvantages. Data Pre-Processing : Introduction , Task of Data Pre-processing , Data Cleaning , Data Integration , Transformation. , Data Reduction

**UNIT 2**

Data Mining Techniques : Introduction , Decision Tree , Clustering , Genetic Algorithms , Artificial Neural Networks Data Warehouse : Introduction , Definition ,Characteristics , Difference between Data Warehouse and Database System , Advantage and Disadvantages , Relationship between Data Mining and Data Warehousing

**UNIT 3**

Data Warehouse Architecture : Data Warehouse Architectures , Overall and Typical Architecture ,Three-Tier architecture , Problem in Three-Tier architecture ,Goal of Data Warehouse Architecture , Frameworks of Data Warehouse , Data Warehouse back-end Tools and Utilities

**UNIT 4**

Components of Data Warehouse : Components of Data Warehouse , Meta Data :Introduction ,Definition , Types of Meta data , Use of Meta Data , Data Marts , Access Tools , Data Warehouse Database

**UNIT 5**

On-Line Analytical Processing : Introduction , Characteristics of OLAP System 7.3 Motivation for using OLAP 7.4 Multidimensional View and Operations , Guidelines for OLAP Implementation , Difference between OLAP & OLTP , Servers : OLAP , ROLAP , MOLAP

**REFERECES BOOKS :**

1. Data Mining and Data Warehousing, Bharat Bhushan Agarwal, Sumit Prakash Tayal, University Science Press Laxmi Publications

2. Data Mining Data Warehousing and OLAP, Gajendra Sharma, KATSON Books.

3. Data Warehousing & Data Mining & OLAP, Berson: TMH

4. Data Mining Concepts & Techniques, Jiawei Han and Micheline Kamber, Elsevier Pub.

5. Data Mining Techniques, University Press. Arun.K.Pujari,

**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1:Understand the Data Mining and its architecture.

CO2: Understand the Data Mining Techniques .

CO3: Understand the Frame work and architecture of Data Warehouse.

CO4: Understand the different Components of Data Warehouse.

CO5: Perform On-Line Analytical Processing.

**Table : Mapping of Course Outcomes with Program Outcomes**

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | L | H | L | M | M | L | M | L | L | - | - | M |
| CO2 | M | H | L | L | M | - | - | - | M | L | M - | |
| CO3 | L | M | - | M | L | L | - | - | H | M | - | M |
| CO4 | M | H | - | L | M | M | L | L | M | H | - | M |
| CO5 | - | - | L | L | M | L | L | L | L | - | - | L |

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## DIPCS603: Introduction to Network Security and Cryptography

**Course Objective**:

- Upon completion of this course, student should be able to define information security & attacks.
- Define key terms and critical concepts of information security
- Able to Apply the security with different techniques.
- Describe the information security roles of professionals within an organization

**UNIT 1**

Computer Security : Introduction , Need of Security , Security approaches , Principle of Securit. Attacks on Computer : Attacks: A general and technical view , Active and passive attacks , Program that attacks: Virus ,Worm, Trojan horse , Applets, ActiveX controls , Cookies, Scripts

Preventing Virus , Specific attacks : Sniffing and Spoofing , Phishing , Pharming or DNS spoofing

**UNIT 2**

Cryptographic : Concepts and Techniques :Plain and Cipher Text , Substitution techniques ,Caesar Cipher , Mono-alphabetic Cipher , Polyalphabetic substitution Cipher , Playfair Cipher ,Transposition Techniques , Rail Fence Technique , Simple Columnar Transposition Technique , Vernam Cipher (One time pad) , Encryption and Decryption

**UNIT 3**

Symmetric and Asymmetric Key Cryptography , Block and stream cipher ,Overview of Symmetric Key Cryptography ,Overview of Asymmetric Key Cryptography , Digital signature , Concept of message digests . Internet Security Protocols : Basic concept , Introduction of TCP/IP , Brief Overview of : Secure socket layer (SSL) , Secure Hyper Text Transfer Protocol (SHTTP) , Time stamping Protocol (TSP) ,Secure Electronic Transaction (SET)

**UNIT 4**

E-mail Security: Introduction , SMTP , Brief Overview of : Privacy Enhanced Mail (PEM) , Pretty good privacy (PGP) , Secure multipurpose secure Internet mail Extensions (SMIME)

**UNIT 5**

Firewall : Introduction , Types of firewall , Packet filter , Application gateways ,Concepts of DMZ , Limitation of firewall , Virtual Private Network (VPN) , Intrusion

**REFERECE BOOKS :**


1. Cryptography and Network Security Atul Kahate, TMH

2. Cryptography and Network Security Behrouz Forouzan, TMH / MH

3. Network Security Essentials Stallings W Pearson Education Asia

4. Cryptography and Network Security Stallings W Pearson Education Asia

5. Network Security Kaufmann Charlie et al. Pearson Education Asia 6. Network and Internet Security Vijay Ahuja A P Professional


**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1: Understand the concept of Computer Security and types of attack.

CO2: Understand the Cryptographic Concepts and Techniques.

CO3: Understand the Symmetric and Asymmetric Key Cryptography.

CO4: Understand the E-mail Security.

CO5: Understand the Firewall and its types.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | L | H | | M | M | L | M | L | L | - | - | M |
| CO2 | M | H | M | L | M | - | M | - | M | L | M - | |
| CO3 | L | L | M | M | L | L | - | - | H | - | - | M |
| CO4 | M | L | - | L | M | M | L | L | M | H | - | M |
| CO5 | - | - | L | L | M | L | L | L | L | - | - | L |

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## DIPCS604: Java Tools

**Course Objective:**

- This course helps the students to get hands on experience on Java and to develop the cross platform applications.
- Leverage the object-oriented features of the Java language .
- This course covers all the necessary topics that any students require to create an application in Java.

**UNIT 1**

Java Fundamentals: Introduction Features of Java , Types of Java programs , Application programs , Applets , Sevlets , Java architecture 1.8 JDK tools Applet : Basics of applet , Applet life cycle , Applet tag , Paint( ), Update( ), Repaint( ), SetBackground( ), SetForeground( ), ShowStatus ( ) , Different between applet and application programs

**UNIT 2**

Graphics : Drawing lines, Arc, Drawing rectangles, oval , Drawing ploggon, Polyline , Clipping

AWT and Event Handling: Component , Frame , Button class , Layout managers ,Label , Text field, text area , Check box, check box group , Choice, list, menu , Event handling , Adaptor class

**UNIT 3**

Swing : Introduction to JFC , JApplets, JToolTip class , JLabel, JButton , Text components , JList, JCombobox , JTable, JScrollPane 5.7 JCheck box, JTtext area

**UNIT 4**

JDBC : Database connectivity , JDBC application architecture , Obtaining connection , Statement Object , Working with Result Set , Prepared statements , Query Prepared Statement

**UNIT 5**

Servlet : Java servlet , Servlet container , Servlet life cycle ,Servlet interface , Generic servlet, Http servlet class , HttpServletRequest, HttpServletResponse interface , getOutputStream, setHeader methods , Parameter passing to servlet

**REFERECE BOOKS:**


1. Internet and Java Programing R.Krishnamurthy,S. Prabhu New age

2. The Complete Reference Java 2 Herbert Schildt, (TMH)

3. Thinking in Java Bruce Eckel, President Mind View Inc

4. Java 2.0 Programming E.Balaguruswami, (TMH)


**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1: Understand the JAVA fundamentals.

CO2: Perform graphics programming in java .

CO3: Understand the concept of Swing and uses of JFC.

CO4: Perform Database connectivity with JDBC.

CO5: Work with servlets.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | L | H | | M | M | L | M | L | L | - | - | M |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO2 | M | H | M | L | M | - | M | - | M | L | M - | |
| CO3 | L | L | M | M | L | L | - | - | H | - | - | M |
| CO4 | M | L | - | L | M | M | L | L | M | H | - | M |
| CO5 | - | - | L | L | M | L | L | L | L | - | - | L |

**H- High, M- Moderate, L- Low, '-' for No correlation**

## DIPCS605: PHP & MySql

**Course Objective**:

- Students would be able to understand the basics of the PHP.
- Make them ready for developing the web applications with the help of PHP as a language.
- Learn how database is creted in MYSQL as a backend.
- At the completion of this course the students will be able to attain good job in web development sector.

**UNIT 1**

Overview of PHP : Static versus Dynamic Websites, Dynamic Contents from Databases ,Developing Dynamic Internet Applications, Client-Side scripting versus Server-Side Scripting Advantages and Capabilities of PHP , PHP versus ASP.

**UNIT 2**

Basic Scripting, Loop and Conditional Constructs: PHP Scripting Fundamentals , Primitive Data Types , Defining Constants and Variables , Loop Constructs: While, Do-While, For, Exit & Break , Conditional Constructs: If, Else and ElseIf, Switch/Case Statement , PHP Operators: Logical, Relational, Bitwise, Ternary Operator (?)Arrays in PHP : Usage of Arrays in PHP , Initializing Arrays , Adding and Removing Items from Arrays, One-dimensional and Multidimensional arrays , Array Functions

**UNIT 3**

Working with Databases and Forms :Configuring PHP for Database Support , PHP's Database API's , PHP's SQL API , MySQL vs. Acess , MySQL vs. SQL Server , Database Drivers

**UNIT 4**

Using Cookies with PHP : Purpose of Cookies ,Cookies Myths , Setting Cookies , Retrieving, Expiring and Deleting Cookies , Storing Arrays in Cookie

**UNIT 5**

MySQL : Introduction to MySQL , Creating Databases and Tables , Working on Data and Tables , Retrieving and Modifying Data , SQL Functions , SQL Operators , Data Definition Statements , Data Manipulation Statements , Stored Procedures and Functions , Creating Triggers , Creating simple dynamic report using database

**REFERECE BOOKS :**


1. Straight To the Point: PHP, Dinesh Maidasani, Laxmi Publications (Firewall)
2. Straight To the Point: MySQL, Dinesh Maidasani, Laxmi Publications (Firewall)
3. How to Do Everything with PHP & MySQL, Vikram Vaswani, McGraw Hills
4. The Complete Reference MySQL, Vikram Vaswani, TMH
5. Web Database Application with PHP & MySQL, Beighley, SPD/O' Reilly


**COURSE OUTCOMES**

**At the end of the course, the student will be able to**:

CO1: Understand the PHP and scripting.

CO2: Understand Basics of PHP Language .

CO3: Working with Databases and Forms.

CO4: Working with cookis.

CO5: Working on Data and Tables in MYSQL.

**Table : Mapping of Course Outcomes with Program Outcomes**

| **Course Outcomes** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | P011 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | L | H | | M | M | L | M | L | L | - | - | M |
| CO2 | M | H | M | L | M | - | M | - | M | L | M - | |
| CO3 | L | L | M | M | L | L | - | - | H | - | - | M |
| CO4 | M | L | - | L | M | M | L | L | M | H | - | M |
| CO5 | - | - | L | L | M | L | L | L | L | - | - | L |

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## DIPEE605 : Practical Training

## DIPEE606 : Project

### DIPCS607 CORE JAVA LAB

1. Practice programs on applets
2. Practice programs on graphics
3. Practice programs on awt and event handling
4. Practice programs on swing
5. Practice programs on servlets

## DIPCS608: CORE PHP LAB

1. Practice programs for Basic Scripting, Loop and Conditional Constructs.
2. Practice programs for Arrays in PHP.
3. Practice programs for Working with MS-Access Database and Forms.
4. Practice programs for Working with MySQL Database and Forms.
5. Practice programs for Working with Using Cookies with PHP.
6. Practice programs in MySQL for creating Databases and Tables
7. Practice programs in MySQL for Retrieving, Modifying, and Deleting Data
8. Practice programs in MySQL based on stored procedures and functions.
9. Practice programs in MySQL for creating triggers.

## DIPCS609: Major Project

## DIPCS610: Project cum Seminar

## DIPCS611: Social Outreach, Discipline & Extra Curricular Activities

This course aims to cultivate self-confidence, leadership, and community responsibility. It influences academic and personal development, fostering civic responsibility. Students grasp the value of social work and discipline's significance. They contribute to social up-gradation through engagement in organizations, blood donation, awareness programs, and personality development initiatives.