GOVERNMENT OF ANDHRA PRADESH

STATE BOARD OF TECHNICAL EDUCATION AND TRAINING
Andhra Pradesh :: Amaravathi

Globally Competetive
CURRICULUM (C-16)
For Polytechnic Diploma Courses
In Andhra Pradesh

INTERNET *of* THINGS

DIPLOMA IN INFORMATION TECHNOLOGY

Front Cover Page

Objective of the New Curriculum (C-16)

To make the students 'Globally Competetive & Employable' by learning industry relevant subjects & undergoing Industrial training

Suggestions from Industrialists have been incorporated in the Curriculum by organising **Industry Institute Interaction Meet.**

Highlights of the Curriculum (C-16)

❖ 6 months /1 year industrial training in all the Diploma Courses.

❖ 1 year industrial training in collaboration with BOAT (Board of Apprenticeship & Training (SR), Chennai).

❖ Virtual labs for ECE & Computer Branches & Strengthening of Skill Development Centers to provide industrial training to students.

Fundamentals of 'Internet of Things' (IoT) is included for all the Branches in the Subject "Industrial Management & Smart Technologies".

"Communication Skills" and "Life Skills" have been introduced as practical subjects for all the Branches.

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"Computer Fundamentals Laboratory" is introduced for all the Branches in First year. AutoCAD specific to the Branch has been given emphasis in the Curriculum.

C Language, Programmable Logic Controllers (PLC), Microcontrollers, Solar Energy are introduced in Electrical Engineering Branch.
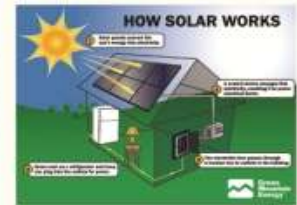
Mobile Communications, Consumer Electronics are introduced in Electronics and Communication Branch

CAD/ CAM, CNC Machines, Power Plant Engineering are introduced in Mechanical Engineering Branch.

OOPS through JAVA, Web Designing, Computer Hardware & Networking are introduced in Computer Engineering Branch.

Automobile Chassis and Body Engineering, Recent Trends In Automobile Engineering, Motor Transport Organization etc are introduced in Automobile Engineering Branch.

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Journal
(JPAP)

The Department of Technical Education, A.P. has a bi- annual 'Journal of Polytechnics of Andhra Pradesh' JPAP

CISCO

CISCO ACADEMIES IN POLYTECHNICS

- 70 Government Polytechnics chosen to have Cisco Academies
- Course Content of CISCO has been incorporated into the ECE and Computer Diploma Courses
- CISCO to train Staff of Polytechnics in two phases to enable them to run the courses effectively
- Students to get 'Certificate from CISCO' along with Diploma Certificate.

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CURRICULUM – 2016

(C-16)

DIPLOMA IN

INFORMATION TECHNOLOGY

State Board of Technical Education & Training

Andhra Pradesh::Amaravathi

Diploma in Information Technology (DIT)
Curriculum C-16

CURRICULUM-2016
(C-16)

FOR DIPLOMA COURSES IN ANDHRA PRADESH

PREAMBLE

The State Board of Technical Education and Training, Andhra Pradesh under the aegis of the Department of Technical Education, Andhra Pradesh generally reviews the Curricula once in every five years. However, recognizing the needs of the industries and enhancing the employability skills of Polytechnic students, the Government of Andhra Pradesh constituted a committee vide G.O.Rt.No:95 of Higher Education (TE) Dept dated: 29-4-2016 and G.O.Rt.No:98 of Higher Education (TE) Dept dated: 4-5-2016 for updation of polytechnic curriculum under the chairmanship of Sri. S. Balasubrahmanyam, IAS (Retd.,). The committee submitted a report on 31-5-2016 making certain recommendations and suggesting new initiatives to be incorporated in the curriculum. An Industry Institute Interaction Meet was organized with Industry experts and subject experts on 26-12-2016 and the suggestions from Industrialists have also been incorporated in the curriculum. The new Curricula for the different diploma courses have been designed with the active participation of the members of the faculty teaching in the Polytechnics of Andhra Pradesh, besides reviewed by Expert Committee constituted with eminent academicians.

The primary objective of the curricular change is to produce best technicians in the country by correlating growing needs of the industries with the academic input.

The revised New Curriculum i.e., Curriculum–2016 (C-16) is approved by BoG of SBTET for its implementation with effect from 2016-17.

Salient Features:

1. Duration of course is either 3 years / 3½ years duration of Regular Academic Instruction.
2. The Curriculum is prepared in Semester Pattern. However, First Year is maintained as Year-wise pattern.
3. 6 Months/ 1 year Industrial Training is introduced for all the Diploma courses.

4. Fundamentals of Internet of Things (IOT) is introduced for all the Diploma courses in the subject.

5. Modern subjects relevant to the industry are introduced in all the Diploma courses.

6. CISCO course content has been incorporated into the ECE and CME courses to get certification from CISCO along with Diploma.

7. The policy decisions taken at the State and Central level with regard to environmental science are implemented by including relevant topics in Chemistry. This is also in accordance with the Supreme Court guidelines issued in Sri Mehta's case.

8. Keeping in view the increased need of communication skills which is playing a major role in the success of Diploma Level students in the Industries, emphasis is given for learning and acquiring listening, speaking, reading and writing skills in English. Further as emphasized in the meetings, Communication Skills lab and Life Skills lab are introduced for all the branches.

9. Modern topics relevant to the needs of the industry and global scenario suitable to be taught at Diploma level are also incorporated in the curriculum.

10. AutoCAD specific to the branch has been given more emphasis in the curriculum. Preparing drawings using CAD software has been given more importance.

11. Every student is exposed to the computer lab at the 1st year itself in order to familiarize himself with skills required for keyboard/mouse operation, internet usage and e-mailing.

12. Upon reviewing the existing C-14 curriculum, it is found that the theory content is found to have more weightage than the Practical content. In the revised C-16 curriculum, more emphasis is given to the practical content of Laboratories and Workshops, thus strengthening the practical skills.

13. With increased emphasis for the student to acquire Practical skills, the course content in all the subjects is thoroughly reviewed and structured as outcome based than the conventional procedure based.

14. Curricula of Laboratory and Workshops have been thoroughly revised based on the suggestions received from the industry and faculty, for better utilization of the equipment available at the Polytechnics. The experiments /exercises that are chosen for the practical sessions are identified to conform to the field requirements of industry.

15. The Members of the working group are grateful to Sri G.S. Panda Das, I.A.S., Special Commissioner of Technical Education & Chairman of SBTET, AP. and Sri. Adityanath Das, I.A.S., Principal Secretary of Higher Education for their guidance and valuable inputs in revising, modifying and updating the curriculum.

16. The Members acknowledge with thanks the cooperation and guidance provided by Sri. A.Nirmal Kumar Priya, Secretary, SBTET, Andhra Pradesh and other officials of Directorate of Technical Education and the State Board of Technical Education, Andhra Pradesh, experts from industry, academia from the universities and higher learning institutions and all teaching fraternity from the Polytechnics who are directly or indirectly involved in preparation of the curricula.

RULES AND REGULATIONS

1   DURATION AND PATTERN OF THE COURSES

All the Diploma programs run at various institutions are of AICTE approved 3 years or 3½ years duration of academic instruction.

All the Diploma courses are run on year wise pattern in the first year, and the remaining two or two & half years are run in the semester pattern. In respect of few courses like Diploma in BM course, the training will be in the seventh semester. Run-through system is adopted for all the Diploma Courses, subject to eligibility conditions.

2   PROCEDURE FOR ADMISSION INTO THE DIPLOMA COURSES:

Selection of candidates is governed by the Rules and regulations laid down in this regard from time to time.

a)   Candidates who wish to seek admission in any of the Diploma courses will have to appear for Common Entrance Test for admissions into Polytechnics (POLYCET) conducted by the State Board of Technical Education and Training, Andhra Pradesh, Vijayawada.

Only the candidates satisfying the following requirements will be eligible to appear for

the Common Entrance Test for admissions into Polytechnics (POLYCET).

b)   The candidates seeking admission should have appeared for S.S.C examination, conducted by the Board of Secondary Education, Andhra Pradesh or equivalent examination thereto, at the time of making application to the Common Entrance Test for admissions into Polytechnics (POLYCET). In case of candidates whose results of their Qualifying Examinations is pending, their selection shall be subject to production of proof of their passing the qualifying examination in one attempt or compartmentally at the time of admission

c)   Admissions are made based on the merit obtained in the Common Entrance Test (POLYCET) and the reservation rules stipulated by the Government of Andhra Pradesh from time to time.

d)   For admission into the following Diploma Courses for which entry qualification is 10+2, candidates need not appear for POLYCET. A separate notification will be issued for admission into these courses.
1). D.H.M.C.T. 2).D. Pharmacy

3   MEDIUM OF INSTRUCTION

The medium of instruction and examination shall be English.

4   PERMANENT IDENTIFICATION NUMBER (PIN)

A cumulative / academic record is to be maintained of the Marks secured in sessional work and end examination of each year for determining the eligibility for promotion etc., A Permanent Identification Number (PIN) will be allotted to each admitted candidate to maintain academic records.

5   NUMBER OF WORKING DAYS PER SEMESTER / YEAR:

a). The Academic year for all the Courses shall be in accordance with the Academic Calendar.

b). The Working days in a week shall be from Monday to Saturday

c). There shall be 7 periods of 50 minutes duration on all working days.

d). The minimum number of working days for each semester / year shall be 90 / 180 days excluding examination days. If this prescribed minimum is not achieved due to any reason, special arrangements shall be made to conduct classes to cover the syllabus.

6   ELIGIBILITY OF ATTENDANCE TO APPEAR FOR THE END EXAMINATION

a). A candidate shall be permitted to appear for the end examination in all subjects, if he or she has attended a minimum of 75% of working days during the year/Semester.

b). Condonation of shortage of attendance in aggregate upto 10% (65% and above and below 75%) in each semester or 1st year may be granted on medical grounds.

c). A stipulated fee shall be payable towards condonation for shortage of attendance.

d). Candidates having less than 65% attendance shall be detained.

e). Students whose shortage of attendance is not condoned in any semester / 1st year and not paid the condonation fee in time are not eligible to take their end examination of that class and their admissions shall stand cancelled. They may seek re-admission for that semester / 1st year when offered next.

7   READMISSION

Readmission shall be granted to eligible candidates by the respective Principal/ Regional Joint Director.

1. a) Within 15 days after commencement of class work in any semester (Except Industrial Training).

   b) For Industrial Training: before commencement of the Industrial training.

2. Within 30 days after commencement of class works in any year (including D. Pharmacy course or first year course in Engineering and Non Engineering Diploma streams).

Otherwise such cases shall not be considered for readmission for that semester / year and are advised to seek readmission in the next subsequent eligible academic year.

The percentage of attendance of the readmitted candidates shall be calculated from the first day of beginning of the regular class work for that year / Semester, as officially announced by CTE/SBTET but not from the day on which he/she has actually reported to the class work, after readmission is granted.

8 SCHEME OF EXAMINATION

a) First Year

THEORY EXAMINATION: Each Subject carries 80% marks with examination of 3 hours duration, along with 20% marks for internal evaluation. (Sessional marks). However, there are no minimum marks prescribed for sessionals.

PRACTICAL EXAMINATION: There shall be 40% Marks for regular practical work done, i.e. sessional marks for each practical subject with an end examination of 3 hours duration carrying 60% marks. However, there are no minimum marks prescribed for sessionals.

b) III, IV, V, VI and VII Semesters:

THEORY EXAMINATION: Each subject carries usually 80 marks and 30 marks in respect of specified subjects of 3hours duration, along with 20 marks for internal evaluation (sessional marks) respectively.

PRACTICAL EXAMINATION: Each subject carry 60/30 marks of 3hours duration 40/20 sessional marks.

9 INTERNAL ASSESSMENT SCHEME

a) Theory Subjects: Theory Subjects carry 20% sessional marks, Internal examinations will be conducted for awarding sessional marks on the dates specified. **Three unit tests will be conducted for I year students and two Unit Tests for semesters.** Average of marks obtained in all the prescribed tests will be considered for awarding the sessional marks.

b) Practical Subjects: Student's performance in Laboratories / Workshop shall be assessed during the year/ semester of study for 40% marks in each practical

subject. Allotment of marks should be discrete taking into consideration of the students' skills, accuracy, recording and performance of the task assigned to him / her. Each student has to write a record / log book for assessment purpose. In the subject of Drawing, which is also considered as a practical paper, the same rules hold good. Drawing exercises are to be filed in seriatum.

c) Internal assessment in Labs / workshops / Survey field work etc., during the course of study shall be done and sessional marks shall be awarded by the concerned Lecturer / Senior Lecturer / Workshop superintendent as the case may be.

d) For practical examinations, except in drawing, there shall be two examiners. External examiner shall be appointed by the Principal in consultation with respective Head of Section preferably choosing a qualified person from any local Industry/ nearby Government Polytechnic/ Local Government Organization. Internal examiner shall be the person concerned with internal assessment as in (c) above. The end examination shall be held along with all theory papers in respect of drawing.

e) Question Paper for Practicals: Question paper should cover all the experiments / exercise prescribed.

f) Records pertaining to internal assessment marks of both theory and practical subjects are to be maintained for official inspection.

g) **In case of Diploma courses *having* Industrial Training**, the training assessment shall be done and the marks are to be awarded in the following manner.

Industrial assessment   :   200 marks (in two spells of 100 marks each)

Maintenance of log book   :   30 marks

Record Work   :   30 marks

Seminar / viva-voce   :   40 marks

TOTAL   :   300 marks

The assessment at the institution level (Seminar/Viva-voce)shall be done by three members, viz., Internal Faculty member, External Examiner and Head of Section and be averaged.

10   MINIMUM PASS MARKS

THEORY EXAMINATION:

For passing a theory subject, a candidate has to secure a minimum of 35% in end examination and a combined minimum of 35% of both Sessional and end examination marks put together.

PRACTICAL EXAMINATION:

For passing a practical subject, a candidate has to secure a minimum of 50% in end examination and a combined minimum of 50% of both sessional and practical end examination marks put together. In case of D.C.C.P., the pass mark for typewriting and short hand is 45% in the end examination. There are no sessional marks for typewriting and Shorthand subjects of D.C.C.P course.

11. PROVISION FOR IMPROVEMENT

1. Improvement is allowed only after he / she has completed all the subjects from First Year to Final semester of the Diploma.

2. Improvement is allowed in any 4 (Four) subjects of the Diploma.

3. The student can avail of this improvement chance **ONLY ONCE**, that too within the succeeding two examinations after the completion of Diploma. However, the duration including Improvement examination shall not exceed <u>FIVE</u> years from the year of first admission.

4. No improvement is allowed in Practical / Lab subjects or Project work or Industrial Training assessment. However, improvement in drawing subject(s) is allowed.

5. If improvement is not achieved, the marks obtained in previous Examinations hold good.

6. Improvement is not allowed in respect of the candidates who are punished under Mal-practice in any Examination.

7. Examination fee for improvement shall be paid as per the notification issued by State Board of Technical Education and Training from time to time.

8. All the candidates who wish to appear for improvement of performance shall deposit the original Marks Memos of all the years / Semesters and also original Diploma Certificate to the Board. If there is improvement in performance of the current examination, the revised Memorandum of marks and Original Diploma Certificate will be issued, else the submitted originals will be returned.

12. RULES OF PROMOTION FROM 1ST YEAR TO 3,^{rd,} 4,th 5th ,6th and 7th SEMESTERS:

a) **For Diploma Courses of 3 Years duration**

i. A candidate shall be permitted to appear for first year examination provided he / she puts in 75% attendance (which can be condoned on Medical grounds upto 10%) i.e. attendance after condonation on Medical grounds should not be less than 65% and pay the examination fee.

ii. A candidate shall be promoted to 3rd semester if he/she puts the required percentage of attendance in the first year and pays the examination fee. A candidate who could not pay the first year examination fee has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 3rd semester.

iii. A candidate shall be promoted to 4th semester provided he/she puts the required percentage of attendance in the 3rd semester and pay the examination fee. A candidate who could not pay the 3rd semester exam fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 4th semester.

A candidate is eligible to appear for the 4th semester examination if he/she

i) Puts the required percentage of attendance in the 4th semester

ii) Should not have failed in more than Four backlog subjects of 1st year

For IVC & ITI Lateral Entry Students:

A candidate is eligible to appear for the 4th semester examination if he/she puts the required percentage of attendance in the 4th semester

iv) A candidate shall be promoted to 5th semester provided he / she puts the required percentage of attendance in the 4th semester and pays the examination fee. A candidate, who could not pay the 4th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 5th semester.

A candidate is eligible to appear for the 5th semester examination if he/she

i) Puts the required percentage of attendance in the 5th semester

ii) Should get eligibility to appear for 4th Semester examination.

For IVC& ITI Lateral Entry students:

i) Puts the required percentage of attendance in the 5th semester

ii) Should not have failed in more than Four backlog subjects of 3rd Semester

v)   A candidate shall be promoted to 6th semester provided he/she puts in the required percentage of attendance in the 5th semester and pay the examination fee. A candidate who could not pay the 5th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 6th semester.

A candidate is eligible to appear for 6th semester Industrial Training assessment (Seminar/Viva-voce)

i) Puts the required percentage of attendance, ie., 90% in 6th semester Industrial

Training

ii) Should get eligibility to appear for 4th Semester Examination.

For IVC & ITI Lateral Entry students:

i)   Puts the required percentage of attendance, ie., 90% in 6th semester Industrial Training.

ii)   should get eligibility to appear for 5th Semester Examination.

Important Note:

Seminar/Viva-voce should not be conducted for Not-Eligible Candidates, till the candidate gets eligibility. The record of internal assessment for Industrial Training for 260 marks shall be maintained at Institution Level for all candidates and the data is to be uploaded only for eligible candidates. For not eligible candidates the data is to be uploaded as and when the candidate gets eligibility.

b)   For Diploma Courses of 3 ½ Years duration (MET/ CH/ CHPP/ CHPC/ CHOT/ TT):

1.   A candidate shall be permitted to appear for 1st year examination provided he / she puts in 75% attendance (which can be condoned on Medical grounds upto 10%) i.e. attendance after condonation on Medical grounds should not be less than 65% and pay the examination fee.

2.   A candidate shall be promoted to 3rd semester if he/she puts the required percentage of attendance in the 1st year and pays the examination fee. A candidate who could not pay the 1st year examination fee has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 3rd semester.

3.   A candidate shall be promoted to 4th semester provided he/she puts the required percentage of attendance in the 3rd semester and pay the examination fee. A candidate, who could not pay the 3rd semester exam fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 4th semester.
A candidate is eligible to appear for the 4th semester exam if he/she

i)   Puts the required percentage of attendance in the 4th semester

ii)   Should not have failed in more than <u>Four backlog subjects of 1st year.</u>

For IVC & ITI Lateral Entry students:

(i) Puts the required percentage of attendance in the 4th semester

4.   A candidate shall be promoted to 5th semester industrial training provided he / she puts the required percentage of attendance in the 4th semester and pays the examination fee. A candidate, who could not pay the 4th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 5th semester.

5.   Promotion from 5th to 6th semester is automatic (i.e., from 1st spell of Industrial Training to 2nd spell) provided he/she puts the required percentage of attendance, which in this case ie.,90 % of attendance and attends for the VIVA-VOCE examination at the end of training.

6.   A candidate shall be promoted to 7th semester provided he / she puts the required percentage of attendance in the 6th semester and pays the examination fee. A candidate, who could not pay the 6th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training   from time to time before commencement of 7th semester.

7.   A candidate shall be promoted to 7th semester of the course provided he/she has successfully completed both the spells of Industrial Training.

A candidate is eligible to appear for 7th semester examination if he/she

i)   Puts the required percentage of attendance in the 7th semester

ii)   Should get eligibility to appear for 4th semester Examination.

For IVC & ITI Lateral Entry students:

i) Puts the required percentage of attendance in the 7th semester

ii) Should not have failed more than four backlog subjects of 3rd Semester

OTHER DETAILS

a)   In case a candidate does not successfully complete the Industrial training, he / she will have to repeat the training at his / her own cost.

b)   The I spell of Industrial training shall commence 10 days after the completion of the last theory examination of 4th Semester.

c)   The Second spell of Industrial training shall commence within 10 days after the completion of I spell of Industrial training.

c) For Diploma Courses of 3 ½ Years duration (BM):

The same rules which are applicable for conventional courses also apply for this course. The industrial training in respect of this course is restricted to one semester (6 months) after the 6th semester (3 years) of the course.

1. A candidate shall be permitted to appear for first year examination provided he / she puts in 75% attendance (which can be condoned on Medical grounds upto 10%) i.e. attendance after condonation on Medical grounds should not be less than 65% and pay the examination fee.

2. A candidate shall be promoted to 3rd semester if he/she puts the required percentage of attendance in the first year and pays the examination fee. A candidate who could not pay the first year examination fee has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 3rd semester.

3. A candidate shall be promoted to 4th semester provided he/she puts the required percentage of attendance in the 3rd semester and pay the examination fee. A candidate who could not pay the 3rd semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 4th semester.

   A candidate is eligible to appear for the 4th semester examination if he/she

   i) Puts the required percentage of attendance in the 4th semester

   ii) Should not have failed in more than Four backlog subjects of 1st year

For IVC & ITI Lateral Entry Students:

   A candidate is eligible to appear for the 4th semester examination if he/she puts the required percentage of attendance in the 4th semester

4. A candidate shall be promoted to 5th semester provided he / she puts the required percentage of attendance in the 4th semester and pays the examination fee. A candidate, who could not pay the 4th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 5th semester.

   A candidate is eligible to appear for the 5th semester exam if he/she

   i) Puts the required percentage of attendance in the 5th semester

ii) Should get eligibility to appear for 4th Semester examination.

For IVC & ITI Lateral Entry students:

    iii) Puts the required percentage of attendance in the5th semester

    iv) Should not have failed in more than Four backlog subjects of 3rd Semester

5. A candidate shall be promoted to 6th semester provided he/she puts in the required percentage of attendance in the 5th semester and pays the examination fee.

A candidate who could not pay the 5th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 6th semester.

A candidate is eligible to appear for 6th semester examination

i) Puts the required percentage of attendance in 6th semester and

ii) should get eligibility to appear for 4th Semester Examination.

For IVC & ITI Lateral Entry students:

i) Puts the required percentage of attendance in 6th semester.

ii) should get eligibility to appear for 5th Semester Examination.

6. A candidate shall be promoted to 7th semester provided he/she puts the required percentage of attendance in 6th semester and pay the examination fee. A candidate, who could not pay the 6th semester examination fee, has to pay the promotion fee prescribed by SBTET from time to time before commencement of the 7th semester (Industrial Training).

A candidate is eligible to appear for 7th semester Industrial Training assessment

(Seminar/Viva-voce) if he/she

i) Puts the required percentage of attendance, ie., 90% in 7th semester Industrial Training

ii) Should get eligibility to appear for 4th Semester Examination.

For IVC & ITI Lateral Entry students:

i) Puts the required percentage of attendance, ie., 90% in 7th semester Industrial Training.

ii) Should get eligibility to appear for 5th Semester Examination.

Important Note:

Seminar/Viva-voce should not be conducted for Not-Eligible Candidates, till the candidate gets eligibility. However, the record of internal Assessment for Industrial Training for 260 marks shall be maintained at Institution Level for all candidates and the data is to be uploaded only for eligible candidates. For not eligible candidates the data is to be uploaded as and when the candidate gets eligibility.

OTHER DETAILS

a) In case a candidate does not successfully complete the Industrial training, he / she will have to repeat the training at his / her own cost.

b) The Industrial training shall commence 10 days after the completion of the last theory examination of 6th Semester.

13. STUDENTS PERFORMANCE EVALUATION

Successful candidates shall be awarded the Diploma under the following divisions of pass.

1. First Class with Distinction shall be awarded to the candidates who secure an overall aggregate of 75% marks and above.

2. First Class shall be awarded to candidates who secure overall aggregate of 60% marks and above and below 75% marks.

3. Second Class shall be awarded to candidates who secure a pass with an overall aggregate of below 60%.

   The Weightage of marks for various year/Semesters which are taken for computing overall aggregate shall be 25% of I year marks + 100% of 3rd and subsequent Semesters.

   In respect IVC & ITI Lateral Entry candidates who are admitted directly into diploma course at the 3rd semester (i.e., second year) level the aggregate of (100%) marks secured at the 3rd and subsequent semesters of study shall be taken into consideration for determining the overall percentage of marks secured by the candidates for award of class/division.

4. Second Class shall be awarded to all students, who fail to complete the Diploma in the regular 3 years/ 3 ½ years and four subsequent examinations, from the year of first admission.

14. EXAMINATION FEE SCHEDULE:

The examination fee should be as per the notification issued by State Board of Technical Education and Training from time to time.

15. STRUCTURE OF END EXAMINATION QUESTION PAPER:

The question paper for theory examination is patterned in such a manner that the Weightage of periods/marks allotted for each of the topics for a particular subject be considered Examination paper is of 3/6/9 hours duration.

a) Each theory paper consists of Section 'A' and Section 'B'. Section 'A' contains 10 short answer questions. All questions are to be answered and each carries 3 marks Max. Marks: 10 x 3 = 30.
   Section B contains 8 essay type questions including Numerical questions, out of which 5 questions each carrying 10 marks are to be answered.

   Max.Marks: 5 x 10 = 50.

   Total Maximum Marks: 80.

b) For Engineering Drawing Subject (107) consist of section 'A' and section 'B'. Section 'A' contains four (4) questions. All questions in section 'A' are to be answered and each carries 5 marks. Max. Marks: 4 x 5=20. Section 'B' contains six (6) questions. Out of which four (4) questions to be answered and each question carries 10 Marks. Max. Marks 4 x 10 = 40.

c) Practical Examinations
   For Workshop practice and Laboratory Examinations, Each student has to pick up a question paper distributed by Lottery System.

   Max. Marks for an experiment / exercise   : 50%

   Max. Marks for VIVA-VOCE   : 10%

   Total   : 60% (of total marks for the subject)

   In case of practical examinations with 50 marks, the marks will be worked out basing on the above ratio.

   In case of any change in the pattern of question paper, the same shall be informed sufficiently in advance to the candidates.

16.   ISSUE OF MEMORONDUM OF MARKS

All candidates who appear for the end examination will be issued memorandum of marks without any payment of fee. However candidates who lose the original memorandum of marks have to pay the prescribed fee to the Secretary, State Board of Technical Education and Training, A.P. for each duplicate memo.

17.   MAXIMUM PERIOD FOR COMPLETION OF DIPLOMA COURSES:

Maximum period for completion of the diploma courses is twice the duration of the course from the date of First admission (includes the period of detention and discontinuation of studies by student etc) failing which they will have to forfeit the claim for qualifying for the award of Diploma (They will not be permitted to appear for

examinations after that date). This rule applies for all Diploma courses of 3 years and 3 ½ years of engineering and non-engineering courses.

18.   ELIGIBILITY FOR AWARD OF DIPLOMA

A candidate is eligible for award of Diploma Certificate if he / she fulfils the

following academic regulations.

i.   He / She pursued a course of study for not less than 3 / 3 ½ academic years & not more than 6 / 7 academic years.

ii.   He / she has completed all the subjects.

Students who fail to fulfill all the academic requirements for the award of the Diploma within 6 / 7 academic years from the year of admission shall forfeit their seat in the course & their seat shall stand cancelled.

For IVC & ITI Lateral Entry students:

i.   He / She pursued a course of study for not less than 2 / 2 ½ academic years & not more than 4 / 5 academic years.

ii.   He / she has completed all the subjects.

Students who fail to fulfill all the academic requirements for the award of the Diploma within 4 / 5 academic years from the year of admission shall forfeit their seat in the course & their seat shall stand cancelled.

19.   ISSUE OF PHOTO COPY OF VALUED ANSWER SCRIPT, RECOUNTING& REVERIFICATION:

A) FOR ISSUE OF PHOTO COPIES OF VALUED ANSWER SCRIPTS

   1.   A candidate desirous of applying for Photo copy of valued answer script/

         scripts should apply within prescribed date from the date of the declaration

         of the result.

2.   Photo copies of valued answer scripts will be issued to all theory subjects and

         Drawing subject(s).

3.   The Photo copy of valued answer script will be dispatched to the concerned

         candidate's address as mentioned in the application form by post.

4.   No application can be entertained from third parties.

B) FOR RE-COUNTING(RC) and RE-VERIFICATION(RV) OF THE VALUED ANSWER SCRIPT

1. A candidate desirous of applying for Re-verification of valued answer script should

apply within prescribed date from the date of the declaration of the result.

2. Re-verification of valued answer script shall be done for all theory subjects and

Drawing subject(s).

3. The Re-verification committee constituted by the Secretary, SBTETAP with subject

experts shall re-verify the answer scripts.

I) RE-COUNTING

The Officer of SBTET will verify the marks posted and recount them in the already valued answer script. The variations if any will be recorded separately, without making any changes on the already valued answer script. The marks awarded in the original answer script are maintained (hidden).

2) RE-VERIFICATION

(i)   The Committee has to verify the intactness and genuineness of the answer script(s) placed for Re-verification.

(ii)   Initially single member shall carry out the re-verification.

(iii)   On re-verification by single member, if the variation is less than 12% of maximum marks, and if there is no change in the STATUS in the result of the candidate, such cases will not be referred to the next level ie., for 2-Tier evaluation.

(iv)   On re-verification by a single member, if the variation is more than 12% of maximum marks, it will be referred to 2-Tier evaluation.

(v)   If the 2-Tier evaluation confirms variation in marks as more than 12% of maximum marks, the variation is considered as follows:
a) If the candidate has already passed and obtains more than 12% of the maximum marks on Re-verification, then the variation is considered.

b) If the candidate is failed and obtains more than 12% of the maximum marks on Re-verification and secured pass marks on re-verification, then the status of the candidate changes to PASS.

c) If a candidate is failed and obtains more than 12% of the maximum marks on Re-verification and if the marks secured on re-verification are still less than the minimum pass marks, the status of the candidate remain FAIL only.

(vii)   After Re-verification of valued answer script the same or change if any therein on Re-verification, will be communicated to the candidate.

(viii) On Re-verification of Valued Answer Script if the candidate's marks are revised, the fee paid by the candidate will be refunded or else the candidate has to forfeit the fee amount.

4. No request for Photo copies/ Recounting /Re-verification of valued answer script would

be entertained from a candidate who is reported to have resorted to Malpractice in that

examination.

20. MAL PRACTICE CASES:

If any candidate resorts to Mal Practice during examinations, he / she shall be booked and the Punishment shall be awarded as per SBTETAP rules and regulations in vogue.

21. DISCREPANCIES/ PLEAS:

Any Discrepancy /Pleas regarding results etc., shall be represented to the SBTETAP within one month from the date of issue of results. Thereafter, no such cases shall be entertained in any manner.

22. ISSUE OF DUPLICATE DIPLOMA

If a candidate loses his/her original Diploma Certificate and desires a duplicate to be issued he/she should produce written evidence to this effect. He / she may obtain a duplicate from the Secretary, State Board of Technical Education and Training, A.P., on payment of prescribed fee and on production of an affidavit signed before a First Class Magistrate (Judicial) and *non-traceable certificate* from the Department of Police. In case of damage of original Diploma Certificate, he / she may obtain a duplicate certificate by surrendering the original damaged certificate on payment of prescribed fee to the State Board of Technical Education and Training, A.P.

In case the candidate cannot collect the original Diploma within 1 year from the date of issue of the certificate, the candidate has to pay the penalty prescribed by the SBTET from time to time.

23. ISSUE OF MIGRATION CERTIFICATE AND TRANSCRIPTS:

The Board on payment of prescribed fee will issue these certificates for the candidates who intend to prosecute Higher Studies in India or Abroad.

24. GENERAL

i. The Board may change or amend the academic rules and regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students, for whom it is intended, with effect from the dates notified by the competent authority.

ii.	All legal matters pertaining to the State Board of Technical Education and Training are within the jurisdiction of Vijayawada.

iii.	In case of any ambiguity in the interpretation of the above rules, the decision of the Secretary, SBTET, A.P is final.

DIPLOMA IN INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2016 (FIRST YEAR)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Year	Scheme Of Examinations			
		Theory	Practical's		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
IT-101	English	3	-	90	3	20	80	100
IT-102	Engineering Mathematics - I	5	-	150	3	20	80	100
IT-103	Engineering Physics	4	-	120	3	20	80	100
IT-104	Engineering Chemistry and Environmental studies	4	-	120	3	20	80	100
IT-105	Basics of Information Technology	4	-	120	3	20	80	100
IT-106	Programming in C	4	-	120	3	20	80	100
PRACTICAL SUBJECTS								
IT-107	Engineering Drawing	-	6	180	3	40	60	100
IT-108	C Programming Laboratory	-	6	180	3	40	60	100
IT-109	Physics Laboratory	-	3	90	3	20	30	50
IT-110	Chemistry Laboratory	-			3	20	30	50
IT-111	Computer Fundamentals Laboratory	-	3	90	3	40	60	100
	Total	**24**	**18**	**1260**	**-**	**280**	**720**	**1000**

IT-101,102,103,104,107,109,110,111 common with all branches

IT-106 common with CM-106

IT-108 common with CM-10

DIPLOMA IN INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2016 (III Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practical's		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
IT-301	Engineering Mathematics –II	5	-	75	3	20	80	100
IT-302	Digital Electronics& Computer Architecture	6	-	90	3	20	80	100
IT-303	Multimedia Basics	5	-	75	3	20	80	100
IT-304	Data Structures through C	5	-	75	3	20	80	100
IT-305	DBMS	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								
IT-306	Digital Electronics Lab		3	45	3	40	60	100
IT-307	Multimedia lab	-	3	45	3	40	60	100
IT-308	Data Structures Through C Lab	-	4	60	3	40	60	100
IT-309	DBMS Lab	-	6	90	3	40	60	100
	Total	26	16	630	-	260	640	900

* IT-301, IT-302, IT-304,IT-305 common with CM-301, CM-302 ,CM-304,CM-305

DIPLOMA IN INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2016 (IV Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practical's		Duration (hrs)	Session al Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
IT-401	Computer Hardware & Networking	5	-	75	3	20	80	100
IT-402	E-Commerce	5	-	75	3	20	80	100
IT-403	Operating Systems	5	-	75	3	20	80	100
IT-404	Microprocessors	5	-	75	3	20	80	100
IT-405	Web Technologies	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								
IT-406	Computer Hardware & Networking Lab	-	6	90	3	40	60	100
IT-407	Web Technologies Lab	-	4	60	3	40	60	100
IT-408	Communications Skills		3	45	3	40	60	100
IT-409	System Administration Lab		4	60	3	40	60	100
	Total	25	17	630	-	260	640	900

* IT-401, IT-404 common with CM-401, CM-404

DIPLOMA IN INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2016 (V Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
IT-501	Industrial Management & Smart Technologies	5	-	75	3	20	80	100
IT-502	.NET Programming with C#	5	-	75	3	20	80	100
IT-503	OOP Through Java	5	-	75	3	20	80	100
IT-504	Mobile Application Development	5	-	75	3	20	80	100
IT-505	Advances in Information Technology	6	-	90	3	20	80	100
PRACTICAL SUBJECTS								
IT-506	OOP Through Java Lab	-	4	60	3	40	60	100
IT-507	.NET Programming Lab Practice	-	6	90	3	40	60	100
IT-508	Life Skills	-	3	45	3	40	60	100
IT-509	Mobile Application Development Lab	-	3	45	3	40	60	100
	Total	26	16	630	-	260	640	900

* IT-501,IT-502,IT-503,IT-504 common with CM-501,CM-502,CM-402,CM-504

DIPLOMA IN INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTIONS AND EXAMINATION

VI SEMESTER
IT - 601 INDUSTRIAL TRAINING

S.NO	Subject	Duration	Items	Max Marks	Remarks
1	Practical Training in the Industry	6 Months	1.First Assessment (at the end of 3rd month)	100	
			2. Second Assessment (at the end of 6th month)	100	
			3.Training Report a)Log Book b)Record	30 30	
			4. Seminar	40	
TOTAL		300			

The industrial training shall carry **300** marks and pass marks are **50**%.A candidate failing to secure the minimum marks should complete it at his own expenses. No apprenticeship training stipend is payable in such case

During Industrial training the candidate shall put in a minimum of **90%**attendance.

101- ENGLISH
(Common to all Branches)

Subject Title   :   **ENGLISH**
Subject Code   :   **IT- 101**
Periods per Week   :   **3**
Periods per Year   :   **90**

Time Schedule & Weightage

SI No	Major Topics	Titles of the Lessons	No. of Periods	Weightage of Marks	No of Short Answers	No of Long Answers
1	Vocabulary& Need for English	Lessons 1,2& Regular and essential vocabulary	5	13	1	1
2	Grammar	Lessons 11,12 & 19 to 26	30	31	7	1
3	Reading	Lessons 13 To 18	10	10	-	1
4	Writing	Lessons 27 To 40	30	40	-	4
5	English in Action	Lessons 3 To 10	15	16	2	1
		Total	90	110	10	08

Rationale and Scope

Globalization has ushered in an era of opportunities for those who have the necessary competencies. Effective communication is one among them. This shift demands strengthening of English in polytechnics. In C-16 Curriculum the focus is on the special needs of English for technicians.
. This course aims at integration of the four fold language abilities viz., listening, speaking, reading and writing. The use of English for learning technical subjects and

for performing technical functions like, writing reports, giving instructions and interpreting graphics/data is of great importance. Therefore the curriculum C-16 focuses on improving communicative abilities equipping the students to become industry- ready and employable.

On completion of this course the student will be able to:

1.0 Build vocabulary in the direction of future needs
2.0 Learn various grammatical structures
3.0 Read and comprehend English and understand the details and draw inferences
4.0 Learn to be competent in various forms of written communication (writing composition and data interpretation)
5.0 Practice spoken communication suited to various situations.

1.0 Extend their vocabulary in the direction of their future needs
1.1 Locate words, learn spellings, understand meanings
1.2 Pronounce words intelligibly
1.3 Find synonyms and antonyms
1.4 Use affixation
1.5 Comprehend meanings of words by understanding meanings of roots

2.0 Learn various grammatical structures
2.1 Identify and use nouns
2.2 Identify and use pronouns
2.3 Use the present tense
2.4 Use the past tense
2.5 Use the future tense
2.6 Identify and use adjectives
2.7 Identify and use adverbs
2.8 Use prepositions
2.9 Use linkers
2.10 State basic sentence structures
2.11 Construct different types of sentences
2.12 Frame questions to elicit information
2.13 Frame questions for confirmation
2.14 Use active voice
2.15 Use passive voice
2.16 Use direct speech
2.17 Use indirect speech
2.18 Identify and correct errors

3.0 Read and comprehend English
3.1 Identify the main ideas
3.2 Identify the specific details
3.3 Draw inferences
3.4 Give contextual meanings of the words
3.5 Perceive tone in a text

4.0   Learn to excel in various forms of written communication (writing composition and data interpretation)
4.1   Identify components of a good paragraph
4.2   Write types of paragraphs
4.3   Distinguish between formal and informal letters
4.4   Write personal letters
4.5   Write leave letters
4.6   Write official letters
4.7   Write letters of complaints
4.8   Prepare a resume
4.9   Write a cover letter
4.10   Write short messages
4.11   Report incidents
4.12   Report experiments
4.13   Report Industrial visits
4.14   Write work done statements
4.15   Write maintenance reports
4.16   Make notes using Cue method and Mapping method
4.17   Summarize Paragraphs
4.18   Present and Interpret Data from flow charts, tree diagrams, bar graphs, tables, pie charts

Practice spoken communication suited to various situations.
4.19   Use appropriate expressions to greet and take leave
4.20   Use proper expressions to make requests
4.21   Use apt expressions for asking and giving directions
4.22   Use suitable expressions to seek and offer suggestions
4.23   Use suitable expressions to state intentions
4.24   Use suitable expressions to state feelings
4.25   Use appropriate expressions to state agreement and disagreement
4.26   Use proper expressions to make complaints
4.27   Use suitable expressions to express obligations

Course Material
The textbook prepared by the faculty of English of Polytechnics in AP.

Reference Books
1. Essential English Grammar (Intermediate Level)   Raymond Murphy
2. Learn English (A Fun Book of Functional Language, Grammar and Vocabulary)
                                                        Santanu Sinha Chaudhuri
3. Grammar Builder (Entire Series)   Oxford University Press
4. High School English Grammar (Revised Edition)   Wren and Martin
5. Sentence skills with Readings (fourth Edition, Tata McGraw Hill)
                                                        John Langan, Paul Langan
6. Word Power Made Easy   Norman Lewis
7. Spoken English   Shashi Kumar and Dhamija

Engineering Mathematics - I
(Common to all Branches)

Subject Title : **Engineering Mathematics - I**
Subject Code : **IT- 102**
Periods per Week : **05**
Periods per Year : **150**

Time Schedule

S. No	Major Topic	No of Periods		Weightage of Marks	Short Type			Essay Type		
	Unit - I : Algebra	Theory	Practice		R	U	App	R	U	App
1	Logarithms	3	0	0	0	0	0	0	0	0
2	Partial Fractions	5	0	3	0	1	0	0	0	0
3	Matrices and Determinants	10	10	16	2	0	0	0	0	1
	Unit - II : Trigonometry									
4	Trigonometric Ratios	2	0	0	0	0	0	0	0	0
5	Compound Angles	3	2	3	1	0	0	0	0	0
6	Multiple and Submultiple angles	4	4	3	0	1	0	0	0	0
7	Transformations	4	4	5	0	0	0	1/2	0	0
8	Inverse Trigonometric Functions	3	2	5	0	0	0	0	1/2	0
9	Trigonometric Equations	3	2	5	0	0	0	1/2	0	0
10	Properties and solutions of triangles	4	4	5	0	0	0	0	0	1/2
11	Hyperbolic Functions	2	0	0	0	0	0	0	0	0
12	Complex Numbers	4	2	3	1	0	0	0	0	0
	Unit III : Co-ordinate Geometry									
13	Straight Lines	5	3	6	1	1	0	0	0	0
14	Circle	4	2	5	0	0	0	0	1/2	0
15	Conic Sections	4	3	5	0	0	0	0	1/2	0
	Unit – IV : Differential Calculus									
16	Limits and Continuity	4	2	3	0	1	0	0	0	0
17	Differentiation	18	10	23	1	0	0	1	1	0

S. No	Major Topic	No of Periods		Weightage of Marks	Short Type			Essay Type		
	Unit - V : Applications of Differentiation	Theory	Practice		R	U	App	R	U	App
18	Geometrical Applications	3	2	5	0	0	0	0	0	1/2
19	Physical Applications	2	2	5	0	0	0	0	0	1/2
20	Maxima and Minima	3	4	5	0	0	0	0	0	1/2
21	Errors and Approximations	2	0	5	0	0	0	0	0	1/2
	Total	92	58	110	6	4	0	2	2 1/2	3 1/2
				Marks	18	12	0	20	25	35

R:	Remembering type	38 marks
U:	Understanding type	37 marks
App:	Application type	35 marks

Objectives

Upon completion of the course the student shall be able to:

UNIT – I
Algebra

1.0   Use Logarithms in engineering calculations

1.1   Define logarithm and list its properties.

1.2   Distinguish natural logarithms and common logarithms.

1.3   Explain the meaning of e and exponential function.

1.4   State logarithm as a function and its graphical representation.

1.5   Use the logarithms in engineering calculations.

2.0   Resolve Rational Fraction into sum of Partial Fractions in engineering problems

2.1   Define the following fractions of polynomials:

      1.   Rational,

      2.   Proper and

      3.   Improper

2.2   Explain the procedure of resolving rational fractions of the type mentioned below into partial fractions

$$i) \quad \frac{f(x)}{(x+a)(x+b)(x+c)} \qquad ii) \quad \frac{f(x)}{(x+a)^2(x+b)(x+c)}$$

$$iii) \quad \frac{f(x)}{(x^2+a)(x+b)} \qquad iv) \quad \frac{f(x)}{(x+a)(x^2+b)^2}$$

3.0 Use Matrices for solving engineering problems

3.1 Define a matrix and order of a matrix.

3.2 State various types of matrices with examples (upto 3rd order square matrices).

3.3 Compute sum, scalar multiplication and product of matrices.

3.4 Illustrate the properties of these operations such as associative, distributive, commutative properties with examples and counter examples.

3.5 Define the transpose of a matrix and write its properties.

3.6 Define symmetric and skew-symmetric matrices.

3.7 Resolve a square matrix into a sum of symmetric and skew- symmetric matrices with examples in all cases.

3.8 Define minor, co-factor of an element of 2X2 and 3x3 square matrices with examples.

3.9 Expand the determinant of a 3 x 3 matrix using Laplace expansion formula.

3.10 Distinguish singular and non-singular matrices.

3.11 State properties of determinants with simple examples.

3.12 Define multiplicative inverse of a matrix and list properties of adjoint and inverse.

3.13 Compute adjoint and multiplicative inverse of a square matrix.

3.14 Representation of system of linear equations (2 variables in 2 equations and 3 variables in 3 equations) in matrix form.

3.15 Solve system of linear equations using Cramer's rule.

3.16 Solve system of linear equations by matrix inversion method

3.17 State elementary row operations.

3.18 Solve a system of linear equations by Gauss- Jordan method

UNIT – II

Trigonometry :

4.0 Understand Trigonometric Ratios
4.1 Define trigonometric ratios of any angle.

4.2 List the values of trigonometric ratios at specified values.

4.3   Draw graphs of trigonometric functions

4.4   Explain periodicity of trigonometric functions.

5.0   Solve simple problems on Compound Angles

5.1   Define compound angles and state the formulae of $\sin(A\pm B)$, $\cos(A\pm B)$, $\tan(A\pm B)$ and $\cot(A\pm B)$

5.2   Give simple examples on compound angles to derive the values of $\sin 15^0$, $\cos 15^0$, $\sin 75^0$, $\cos 75^0$, $\tan 15^0$, $\tan 75^0$ etc.

5.3   Derive identities like $\sin(A+B) \sin(A-B) = \sin^2 A - \sin^2 B$ etc.,

5.4   Solve simple problems on compound angles.

6.0   Solve problems using the formulae for Multiple and Sub- multiple Angles

6.1   Derive the formulae of multiple angles 2A, 3A etc and sub multiple angles A/2 in terms of angle A of trigonometric functions.

6.2   Derive useful allied formulas like $\sin A = (1 - \cos 2A)/2$ etc.,

6.3   Solve simple problems using the above formulae

7.0   Apply Transformations for solving the problems in Trigonometry

7.1   Derive the formulae on transforming sum or difference of two trigonometric ratios in to a product and vice versa- examples on these formulae.

8.0   Use Inverse Trigonometric Functions for solving engineering problems

8.1   Explain the concept of the inverse of a trigonometric function by selecting an appropriate domain and range.

8.2   Define inverses of six trigonometric functions along with their domains and ranges.

8.3   Derive relations between inverse trigonometric functions so that given $A = \sin^{-1}x$, express angle A in terms of other inverse trigonometric functions - with examples.

8.4   State various properties of inverse trigonometric functions and identities like $\sin^{-1}x + \cos^{-1}x = \dfrac{\pi}{2}$ etc.

8.5   Derive formulae like $\tan^{-1} x + \tan^{-1} y = \tan^{-1}\left(\dfrac{x+y}{1-xy}\right)$, $where \ x \geq 0, y \geq 0, xy < 1$ etc., and solve simple problems.

9.0   Solve Trigonometric Equations in engineering applications

9.1   Explain what is meant by solutions of trigonometric equations and find the general solutions of sin x=k, cos x =k and tan x=k with appropriate examples.

9.2   Solve models of the type a $\sin^2$ x + b sin x +c=0, a cos x + b sin x=c etc., and problems using simple transformations.

10.0   Appreciate Properties of triangles and their solutions

10.1   State sine rule, cosine rule, tangent rule and projection rule.

10.2   Explain the formulae for sin A/2, cos A/2, tan A/2 and cot A/2 in terms of semi-perimeter and sides   a, b, c .

10.3   List various formulae for the area of a triangle.

10.4   Solve problems using the above formulae.

10.5   Solve a triangle when (i) three sides, (ii) two sides and an included angle, (iii) two sides and an opposite angle-case of two solutions and (iv) one side and two angles are given.

11.0   Represent the Hyperbolic Functions in terms of logarithm functions

11.1   Define Sinh x, cosh x and tanh x and list the hyperbolic identities.

11.2   Represent inverse hyperbolic functions in terms of logarithms.

12.0   Represent Complex numbers in various forms

12.1   Define complex number, its modulus , conjugate and list their properties.

12.2   Define the operations on complex numbers with examples.

12.3   Define amplitude of a complex number

12.4   Represent the complex number in various forms like modulus-amplitude (polar) form, Exponential (Euler) form – illustrate with examples.

12.5   State DeMoivre's theorem and its applications to complex numbers e.g., finding the roots, powers, simplifications of a complex number with illustrative examples

UNIT - III

Coordinate Geometry

13.0   Solve the problems on Straight lines

13.1   Write the different forms of a straight line – point slope form, two point form, intercept form, normal form and general form

13.2   Solve simple problems on the above forms

13.3   Find distance of a point from a line, acute angle between two lines, intersection of two non-parallel lines and distance between two parallel lines.

14.0   Solve the problems on Circles

14.1   Define locus of a point – circle and its equation.

14.2   Find the equation of a circle given

    (i)   Center and radius

    (ii)   Two ends of a diameter

    (iii)   Centre and a point on the circumference

    (iv)   Three non collinear points

14.3   Write the general equation of a circle and find the centre and radius.

15.0   Appreciate the properties of Conics in engineering applications

15.1   Define a conic section.

15.2   Explain the terms focus, directrix, eccentricity, axes and latus rectum of a conic with illustrations.

15.3   Find the equation of a conic when focus, directrix and eccentricity are given

15.4   Describe the properties of Parabola, Ellipse and Hyperbola in standard form.

UNIT - IV

Differential Calculus

16.0   Use the concepts of Limit and Continuity for solving the problems

16.1   Explain the concept of limit and meaning of $\lim\limits_{x \to a} f(x) = l$ and state the properties of limits.

16.2   Mention the Standard limits $\lim\limits_{x \to a} \dfrac{x^n - a^n}{x - a}$, $\lim\limits_{x \to 0} \dfrac{\sin x}{x}$, $\lim\limits_{x \to 0} \dfrac{\tan x}{x}$, $\lim\limits_{x \to 0} \dfrac{a^x - 1}{x}$,

$\lim\limits_{x \to 0} \dfrac{e^x - 1}{x}$, $\lim\limits_{x \to 0} (1 + x)^{\frac{1}{x}}$, $\lim\limits_{x \to \infty} \left(1 + \dfrac{1}{x}\right)^x$ (All without proof).

16.3   Solve the problems using the above standard limits

16.4   Evaluate the limits of the type $\lim\limits_{x \to l} \dfrac{a x^2 + b x + c}{\alpha x^2 + \beta x + \gamma}$ and $\lim\limits_{x \to \infty} \dfrac{f(x)}{g(x)}$

16.5   Explain the concept of continuity of a function at a point and on an interval with some examples whether a given function is continuous or not.

17.0   Appreciate Differentiation and its meaning in engineering situations

17.1   State the concept of derivative of a function $y = f(x)$ – definition, first principle as

$$\lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$ and also provide standard notations to denote the derivative

of a function.

17.2   State the significance of derivative in scientific and engineering applications.

17.3   Find the derivatives of elementary functions like x^n , a^x, e^x, log x, sin x, cos x, tanx, Secx, Cosecx and Cot x using the first principles.

17.4   Find the derivatives of simple functions from the first principle .

17.5   State the rules of differentiation of sum, difference, scalar multiplication, product and quotient of functions with illustrative and simple examples.

17.6   Explain the method of differentiation of a function of a function (Chain rule) with illustrative examples such as

    (i) $\sqrt{t^2 + \dfrac{2}{t}}$ **(ii)** $x^2 \sin 2x$ **(iii)** $\dfrac{x}{\sqrt{x^2 + 1}}$ **(iv)** $\log\left(\sin(\cos x)\right)$**.**

17.7   Find the derivatives of Inverse Trigonometric functions and examples using the

Trigonometric transformations.

17.8   Explain the method of differentiation of a function with respect to another function and also differentiation of parametric functions with examples.

17.9   Find the derivatives of hyperbolic functions.

17.10 Explain the procedures for finding the derivatives of implicit function with examples.

17.11 Explain the need of taking logarithms for differentiating some functions with examples like $[f(x)]^{g(x)}$.

17.12 Explain the concept of finding the higher order derivatives of second and third order with examples.

17.13 Explain the concept of functions of several variables, partial derivatives and difference between the ordinary and partial derivatives with simple examples.

17.14 Explain the definition of Homogenous function of degree n

17.15 Explain Euler's theorem for homogeneous functions with applications to simple problems.

UNIT - V

Applications of the Differentiation

18.0   Understand the Geometrical Applications of Derivatives

18.1   State the geometrical meaning of the derivative as the slope of the tangent to the curve y=f(x) at any point on the curve.

18.2   Explain the concept of derivative to find the slope of tangent and to find the equation of tangent and normal to the curve y=f(x) at any point on it.

18.3   Find the lengths of tangent, normal, sub-tangent and sub normal at any point on the curve y=f(x).

18.4   Explain the concept of angle between two curves and procedure for finding the angle between two given curves with illustrative examples.

19.0   Understand the Physical Applications of Derivatives

19.1   Explain the derivative as a rate of change in distance-time relations to find the velocity and acceleration of a moving particle with examples.

19.2   Explain the derivative as a rate measurer in the problems where the quantities like volumes, areas vary with respect to time- illustrative examples.

20.0   Use Derivatives to find extreme values of functions

20.1   Define the concept of increasing and decreasing functions.

20.2   Explain the conditions to find points where the given function is increasing or decreasing with   illustrative examples.

20.3   Explain the procedure to find the extreme values (maxima or minima) of a function of single variable - simple problems yielding maxima and minima.

20.4   Solve problems on maxima and minima in applications like finding areas, volumes, etc.

21.0   Use Derivatives to find Errors and Approximations

21.1   Find the absolute error, approximate error, relative error and percentage error in functions of single variable.

COURSE CONTENT

Unit-I

Algebra

1.   Logarithms :

Definition of logarithm and its properties, natural and common logarithms; the meaning of e and exponential function, logarithm as a function and its graphical representation.

2.   Partial Fractions :

Rational, proper and improper fractions of polynomials. Resolving rational fractions in to their   partial fractions covering the types mentioned below:

$$i) \quad \frac{f(x)}{(x+a)(x+b)(x+c)} \qquad ii) \quad \frac{f(x)}{(x+a)^2(x+b)(x+c)}$$

$$iii) \quad \frac{f(x)}{(x^2+a)(x+b)} \qquad iv) \quad \frac{f(x)}{(x+a)(x^2+b)^2}$$

Matrices:

3.   Definition of matrix, types of matrices-examples, algebra of matrices-equality of two matrices, sum, scalar multiplication and product of matrices. Transpose of a matrix-Symmetric, skew symmetric matrices-Minor, cofactor of an element-Determinant of a square matrix-Laplace's expansion, properties of determinants. Singular and non singular matrices-Adjoint and multiplicative inverse of a square matrix- examples-System of linear equations in 2 or 3 variables-Solutions by Cramer's rule, Matrix inversion method-examples-Elementary row operations on matrices -Gauss-Jordan method to solve a system of equations.

Unit-II

Trigonometry :

4.   Trigonometric ratios: definition   of trigonometric ratios of any angle, values of trigonometric ratios at specified values, draw graphs of trigonometric functions, periodicity of trigonometric functions.

5. **Compound angles:** Formulas of sin(A±B), cos(A±B), tan(A±B),cot(A±B),and related identities with problems.

6. **Multiple and sub multiple angles:** trigonometric ratios of multiple angles 2A,3A and submultiple angle A/2 with problems.

7. Transformations of products into sums or differences and vice versa simple problems

8. **Inverse trigonometric functions :** definition, domains and ranges-basic properties-problems.

9. **Trigonometric equations:** concept of a solution, principal value and general solution of trigonometric equations :

   sin x =k , cos x= k, tan x =k.

   Solutions of simple quadratic equations, equations involving usage of transformations-problems.

10. **Properties and solutions of triangles:** relation between sides and angles of a triangle- sine rule, cosine rule, tangent rule and projection rule-area of a triangle-solving a triangle- problems.

11. **Hyperbolic functions:** Definitions of hyperbolic functions, identities of hyperbolic functions, inverse hyperbolic functions and expression of inverse hyperbolic functions in terms of logarithms.

12. **Complex Numbers:** Definition of a complex number, Modulus and conjugate of a complex number, Arithmetic operations on complex numbers, Modulus- Amplitude (polar) form, Exponential form (Euler) form of a complex number- Problems. DeMoivre's Theorem and its applications in complex numbers- Simple problems.

UNIT-III

Coordinate geometry

13. **Straight lines:** various forms of straight lines, angle between lines, perpendicular distance from a point, distance between parallel lines-examples.

14. **Circle:** locus of a point, Circle definition-Circle equation given (i) center and radius, (ii) two ends of a diameter (iii) centre and a point on the circumference (iv) three non collinear points - general equation of a circle - finding center, radius.

15. Definition of a conic section, equation of a conic when focus directrix and eccentricity are given. Properties of parabola, ellipse and hyperbola, standard forms.

UNIT-IV

Differential Calculus

16.   Concept of Limit- Definition- Properties of Limits and Standard Limits -Simple Problems-Continuity of a function at a point- Simple Examples only.

17.   Concept of derivative- definition (first principle) - different notations-derivatives of elementary functions - problems. Derivatives of sum, product, quotient, scalar multiplication of functions - problems. Chain rule, derivatives of inverse trigonometric functions, derivative of a function with respect to another function, derivative of parametric functions, derivative of hyperbolic, implicit functions, logarithmic differentiation – problems in each case. Higher order derivatives - examples – functions of several variables – partial differentiation, Euler's theorem-simple problems.

UNIT-V

Applications of Derivatives:

18.   Geometrical meaning of the derivative, equations of Tangent and normal to a curve at any point. Lengths of tangent, normal, sub tangent and subnormal to the curve at any point. Angle between the curves - problems.

19.   Physical applications of the derivative – velocity, acceleration, derivative as a rate Measure – Problems.

20.   Applications of the derivative to find the extreme values – Increasing and decreasing functions, finding the maxima and minima of simple functions - problems leading to applications of maxima and minima.

21.   Applications of derivative in finding errors and approximations of functions and simple problems.

Reference Books :

1.   A text book of matrices by Shanti Narayan,
2.   Plane Trigonometry, by S.L Loney
3.   Co-ordinate Geometry, by S.L Loney
4.   Thomas Calculus, Pearson Addison-Wesley publishers
5.   Calculus – I, by Shanti Narayan and Manicavachgam Pillai, S.V Publications

ENGINEERING PHYSICS
(Common to all Branches)

Subject Title	:	**Engineering Physics**
Subject Code	:	**IT -103**
Periods per week	:	**04**
Total periods per year	:	**120**

TIME SCHEDULE

S.No	Major Topics	No. of Periods	Weightage of Marks	Short Answer Type	Essay Type
1.	Units and Dimensions	08	03	1	-
2.	Elements of Vectors	12	13	1	1
3.	Kinematics	14	13	1	1
4.	Friction	08	10	-	1
5.	Work, Power and Energy	12	10	-	1
6.	Simple Harmonic Motion	12	13	1	1
7.	Heat & Thermodynamics	12	13	1	1
8.	Sound	12	13	1	1
9.	Properties of matter	10	06	2	-
10.	Electricity & magnetism	12	13	1	1
11.	Modern Physics	08	03	1	-
	Total:	**120**	**110**	**10**	**8**

OBJECTIVES
Upon completion of the course the student shall be able to

1.0 Understand the concept of Units and dimensions
   1.1 Explain the concept of Units
   1.2 Define the terms
       a) Physical quantity, b) Fundamental physical quantities and
       c) Derived physical quantities
   1.3 Define unit
   1.4 Define fundamental units and derived units
   1.5 State SI units with symbols
   1.6 State Multiples and submultiples in SI system
   1.7 State Rules of writing S.I. units
   1.8 State advantages of SI units
   1.9 Define Dimensions
   1.10 Write Dimensional formulae
   1.11 Derive dimensional formulae of physical quantities
   1.12 List dimensional constants and dimensionless quantities
   1.13 State the principle of Homogeneity of Dimensions
   1.14 State the applications of Dimensional analysis
   1.15 State the limitations of dimensional analysis
   1.16 Solve problems

2.0 Understand the concept of Elements of Vectors
   2.1 Explain the concept of Vectors
   2.2 Define Scalar and Vector quantities

2.3   Give examples for scalar and vector quantities
2.4   Represent vectors graphically
2.5   Classify the Vectors
2.6   Resolve the vectors
2.7   Determine the Resultant of a vector by component method
2.8   Represent a vector in space using unit vectors (I, j, k)
2.9   State triangle law of addition of vectors
2.10   State parallelogram law of addition of vectors
2.11   Illustrate parallelogram law of vectors in case of flying bird and sling.
2.12   Derive expression for magnitude and direction of resultant of two vectors
2.13   State polygon law of addition of vectors
2.14   Explain subtraction of vectors
2.15   Define Dot product of two vectors with examples (Work done, Power)
2.16   Mention the properties of Dot product
2.17   Define Cross products of two vectors with examples (Torque, Linear velocity)
2.18   Mention the properties of Cross product.
2.19   Solve the related numerical problems

3.0   Understand the concept of Kinematics
3.1   Write the equations of motion in a straight line
3.2   Explain the acceleration due to gravity
3.3   Derive expressions for vertical motion
     a) Maximum Height, b) time of ascent, c) time of descent, and d) time of flight
3.4   Derive height of a tower when a body projected vertically upwards from the top of a tower.
3.5   Explain projectile motion with examples
3.6   Explain Horizontal projection
3.7   Derive an expression for the path of a projectile in horizontal projection
3.8   Explain oblique projection
3.9   Derive an expression for the path of projectile in oblique projection
3.10   Derive formulae for projectile in oblique projection
     a) Maximum Height, b) time of ascent, c) time of descent, and d) time of flight
     e) Horizontal Range, f) Maximum range
3.11   Solve the related numerical problems

4.0   Understand the concept of Friction
4.1   Define friction
4.2   Classify the types of friction and define
4.3   Explain the concept of Normal reaction
4.4   State the laws of friction
4.5   Define coefficients of friction
4.6   Explain the Angle of friction
4.7   Derive an expression for acceleration of a body on a rough horizontal surface
4.8   Derive an expression for the displacement and time taken to come to rest over a rough horizontal surface
4.9   Define Angle of repose
4.10   Derive expressions for acceleration of a body on a smooth inclined plane (up and down)
4.11   Derive expressions for acceleration of a body on a rough inclined plane (up and down)

4.12 List the Advantages and Disadvantages of friction
4.13 Mention the methods of minimizing friction
4.14 Solve the related numerical problems

5.0 Understand the concepts of Work, Power, and Energy
5.1   Define the terms 1.Work, 2. Power and Energy
5.2   State SI units and dimensional formulae for 1.Work, 2. Power, and Energy
5.3   Define potential energy and state examples
5.4   Derive the expression for Potential energy
5.5   Define kinetic energy and state examples
5.6   Derive the expression for kinetic energy
5.7   State and derive Work- Energy theorem
5.8   Derive the relation between Kinetic energy and momentum
5.9   State the law of conservation of energy and mention examples
5.10   Verify the law of conservation of energy in the cases of a freely falling body and vertically projected body in the upward direction
5.11   Solve the related numerical problems

6.0 Understand the concept of Simple harmonic motion
6.1   Define Simple harmonic motion
6.2   Give examples for Simple harmonic motion
6.3   State the conditions of Simple harmonic motion
6.4   Explanation of SHM in terms of projection of circular motion on any one of the diameters of the circular path
6.5   Derive expression for displacement
6.6   Derive expression for velocity
6.7   Derive expression for acceleration
6.8   Derive expression for Time period and frequency of S H M
6.9   Define phase of S H M and explain from the expression of displacement
6.10   Define Ideal simple pendulum and derive expression for Time period of simple pendulum
6.11   State the laws of motion of simple pendulum and mention formulae
6.12   Solve the related numerical problems

7.0 Understand the concept of Heat and thermodynamics
7.1   Explain the concept of expansion of gases
7.2   State and explain Boyle's law and also express it in terms of density
7.3   Define absolute zero temperature
7.4   Explain absolute scale of temperature
7.5   State Charles laws in terms of absolute temperature and explain
7.6   Define ideal gas and distinguish from real gas
7.7   Derive Ideal gas equation
7.8   Define Specific gas constant and Universal gas constant
7.9   Explain why universal gas constant is same for all gases
7.10   State SI unit and dimensional formula of universal gas constant
7.11   Calculate the value of universal gas constant
7.12   State the gas equation in different forms (as a function of density and mass)
7.13   Distinguish between r and R
7.14   State and Explain Isothermal process
7.15   State and Explain adiabatic process
7.16   Distinguish between isothermal and adiabatic processes

7.17 State first and second laws of thermodynamics and state applications

7.18 Define specific heats & molar specific heats of a gas and differentiate them

7.19 Derive the relation $C_p - C_v = R$ (Mayer's Equation)

7.20 Solve the relavent numerical problems

8.0 Understand the concept of Sound

8.1 Define the term sound

8.2 Explain longitudinal and transverse wave motion and state differences

8.3 Distinguish between musical sound and noise

8.4 Explain noise pollution and state SI unit for intensity level of sound

8.5 Explain causes of noise pollution

8.6 Explain effects of noise pollution

8.7 Explain methods of minimizing noise pollution

8.8 Explain the phenomenon of beats

8.9 State the applications of beats

8.10 Define Doppler effect

8.11 List the Applications of Doppler effect

8.12 Define reverberation and reverberation time

8.13 Write Sabine's formula and name the parameters contained

8.14 Define and Explain echoes and also state its applications

8.15 State conditions of good auditorium

8.16 Solve the related numerical problems

9.0 Understand the properties of matter

9.1 Define the term Elasticity

9.2 Define the terms stress and strain and also define different types of stress and strain

9.3 State the units and dimensional formulae for stress and strain

9.4 State and explain Hooke's law

9.5 Define surface tension and state examples

9.6 Explain Surface tension with reference to molecular theory

9.7 Define angle of contact

9.8 Define capillarity

9.9 Write the formula for surface tension based on capillarity and name the parameters

9.10 Explain the concept of Viscosity

9.11 Mention examples of Viscosity

9.12 State Newton's formula for viscous force and explain

9.13 Define co-efficient of viscosity and write its units and dimensional formula

9.14 Explain the effect of temperature on viscosity of liquids and gases

9.15 State Poiseulle's equation for Co-efficient of viscosity and name the physical quantities involved

9.16 Solve the related numerical problems

10.0 Understand the concept of Electricity and Magnetism

10.1 Explain the concept of Electricity

10.2 State Ohm's law and write the formula

10.3 Explain Ohm's law

10.4 Define specific resistance, conductance and state their units

10.5 State Kichoff's laws

10.6 Explain Kichoff's laws

10.7 Describe Wheatstone's bridge with legible sketch

10.8 Derive an expression for balancing condition of Wheatstone's bridge

10.9 Describe Meter Bridge experiment for the determination of resistivity with a neat circuit diagram

10.10 Write the formula in Meter Bridge to determine specific resistance

10.11 Explain the concept of magnetism

10.12 State the Coulomb's inverse square law of magnetism

10.13 Define magnetic field and magnetic lines of force and write the properties of magnetic lines of force

10.14 State the Magnetic induction field strength and mention its units and dimensionsal formula

10.15 Derive an expression for the moment of couple on a bar magnet placed in a uniform magnetic field

10.16 Derive Magnetic induction field strength at a point on the axial line

10.17 Derive Magnetic induction field strength at a point on the equatorial line

10.18 Solve the related numerical problems

11.0 Understand the concept of Modern physics

11.1 State and Explain Photo-electric effect

11.2 Write Einstein's photoelectric equation and explain

11.3 State laws of photoelectric effect

11.4 Explain the Working of photoelectric cell

11.5 List the Applications of photoelectric effect

11.6 Recapitulate refraction of light and its laws

11.7 Define critical angle

11.8 Explain the Total Internal Reflection

11.9 Explain the principle and working of Optical Fiber

11.10 Mention types of optical fibbers

11.11 List the applications of Optical Fiber

11.12 Define super conductor and superconductivity and mention examples for superconductors

11.13 State the properties of superconducting materials

11.14 List the applications of superconductors

COURSE CONTENT

1. Units and Dimensions:
Introduction – Physical quantity – Fundamental and Derived quantities – Fundamental and Derived units- SI units –Multiples and Sub multiples – Rules for writing S.I. units- Advantages of SI units – Dimensions and Dimensional formulae- Dimensional constants and Dimensionless quantities- Principle of Homogeneity- Advantages and limitations of Dimensional analysis- - Problems.

2. Elements of Vectors:
Scalars and Vectors –Types of vectors(Proper Vector, Null Vector, Unit Vector, Equal , Negative Vector, Like Vectors, Co-Initial Vectors, Co-planar Vectors and Position Vector).Addition of vectors- Representation of vectors- Resolution of vectors - Parallelogram, Triangle and Polygon laws of vectors–Subtraction of vectors- Dot and Cross products of vectors-Problems

3. Kinematics

Introduction- Concept of acceleration due to gravity- Equations of motion for a freely falling body and for a body thrown up vertically- Projectiles- Horizontal and Oblique projections- Expressions for maximum height, time of flight, range - problems

4. Friction:

Introduction to friction- Causes- Types of friction- Laws of friction- Angle of repose- Angle of friction— Motion of a body over a horizontal surface- smooth inclined plane- rough inclined plane- Advantages and disadvantages of friction- Methods of reducing friction – Problems

5. Work, Power and Energy:

Work, Power and Energy- Definitions and explanation- potential energy- kinetic energy-Derivations of Potential and Kinetic energies-K.E and Momentum relation - Work-Energy theorem- Law of Conservation of energy- Problems

6. Simple Harmonic Motion:

Introduction- Conditions of SHM- Definition- Examples- Expressions for displacement, velocity, acceleration, Time period, frequency and phase in SHM- Time period of a simple pendulum- Laws of simple pendulum-seconds pendulum- Problems

7. Heat and Thermodynamics:

Expansion of Gases- Boyle's law- Absolute scale of temperature- Charles laws- Ideal gas equation- Universal gas constant- Differences between r and R- Isothermal and adiabatic processes- Laws of thermodynamics- Specific heats - molar specific heats of a gas –Derivation of Mayer's Equation- Problems

8. Sound:

Sound- Nature of sound- Types of wave motion -musical sound and noise- Noise pollution – Causes & effects- Methods of reducing noise pollution- Beats- Doppler effect- Echo- Reverberation-Reverberation time-Sabine 's formula-Conditions of good auditorium- Problems

9. Properties of matter

Definition of Elasticity –Definition of stress and strain -the units and dimensional formulae for stress and strain-The Hooke's law- Definition of surface tension- Explanation of Surface tension with reference to molecular theory - Definition of angle of contact - Definition of capillarity -The formula for surface tension based on capillarity - Explanation of concept of Viscosity - Examples for surface tension and Viscosity - Newton's formula for viscous force- Definition of co-efficient of viscosity- The effect of temperature on viscosity of liquids and gases - Poiseuille's equation for Co-efficient of viscosity- The related numerical problems

10. Electricity & Magnetism:

Ohm's law and explanation- Specific resistance- Kirchoff 's laws- Wheatstone's bridge - Meter bridge- Coulomb's inverse square law magnetic field- magnetic lines of force-Magnetic induction field strength- magnetic induction field strength at a point on the axial line - magnetic induction field strength at a point on the equatorial line –problems.

11.   Modern Physics;
Photoelectric effect –Einstein's photoelectric equation-laws of photoelectric effect - photoelectric cell –Applications of photo electric effect- Total internal reflection- fiber optics- -principle and working of an optical fiber-types of optical fibers - Applications of optical fibers- superconductivity - applications

REFERENCE BOOKS

1. Intermediate physics Volume-I & 2	Telugu Academy (English version)
2. Unified physics Volume 1,2,3 and 4	Dr.S.L Guptha and Sanjeev Guptha
3. Text book of physics Volume I	Resnick & Holiday
4. Text book of applied physics	Dhanpath Roy
5. Fibre optics	D.A Hill
6. NCERT Text Books ----------------- XI & XII Standard	

Blue Print for setting question paper at different levels

S.No	Major Topics	No. of Periods	Weightage of Marks	Short answer type			Essay type		
				K	U	A	K	U	A
1.	Units and Dimensions	08	03	1	0	0	0	0	0
2.	Elements of Vectors	12	13	0	0	1	0	1	0
3.	Kinematics	14	13	0	1	0	1	0	0
4.	Friction	08	10	0	0	0	0	1	0
5.	Work, Power and Energy	12	10	0	0	0	0	1	0
6.	Simple Harmonic Motion	12	13	0	0	1	0	1	0
7.	Heat & Thermodynamics	12	13	0	1	0	1	0	0
8.	Sound	12	13	0	1	0	0	0	1
9.	Properties of Matter	10	06	1	1	0	0	0	0
10.	Electricity & magnetism	12	13	0	1	0	0	1	0
11.	Modern Physics	08	03	1	0	0	0	0	0
	Total:	**120**	**110**	**3**	**5**	**2**	**2**	**5**	**1**

ENGINEERINGCHEMISTRY & ENVIRONMENTALSTUDIES
(Common to all Branches)

Subject Title : **Engineering Chemistry & Environmental Studies**
Subject Code : **IT-104**
Periods per week : **04**
Total periods per year : **120**

Scheme of instruction and examination Time Schedule

S.No	Major topic	No of Periods	Weight age of marks	Short type (3marks)			Essay type (10 marks)			remarks
				R	U	A	R	U	A	
A. ENGINEERING CHEMISTRY										
1	Fundamentals of Chemistry	18	16	1	0	1	0	1	0	
2	Solutions	10	8	1	0	0	0	0	1/2	5 mark
3	Acids and bases	10	8	0	0	1	0	1/2	0	5 mark
4	Principles of Metallurgy	10	10	0	0	0	1	0	0	
5	Electrochemistry	14	13	0	1	0	0	0	1	
6	Corrosion	8	10	0	0	0	0	1	0	
7	Water Technology	14	13	1	0	0	1	0	0	
8	Polymers	12	13	1	0	0	1	0	0	
9	Fuels	6	3	1	0	0	0	0	0	
B. ENVIRONMENTAL STUDIES		18	16	1	1	0	0	1	0	
	total	120	110	6	2	2	3	3 1/2	1 1/2	
				18	6	6	30	35	15	

OBJECTIVES

Upon completion of the course the student shall be able to

A.ENGINEERINGCHEMISTRY

1.0   Understand the concept of Atomic structur

1.1   Explain the charge and mass of fundamental particles of an atom (electron, proton and neutron)

1.2   Explain the concept of atomic number and mass number.

1.3   State the Postulates of Bohr's atomic theory and its limitations.

1.4   Explain the significance of four Quantum numbers.

1.5   Explain 1.Aufbau principle, 2 Pauli's exclusion principle 3 Hund's rule.

1.6   Define Orbital in an atom.

1.7   Draw the shapes of s, p and d- Orbitals .

1.8   Distinguish between Orbit and Orbital

1.9   Write the electronic configuration of elements up to atomic number 30

1.10   Explain the significance of chemical bonding

1.11   Explain the Postulates of Electronic theory of valency

1.12   Define the types of Chemical bonding viz.,Ionic, Covalent bonds.

1.13   Explain the types of Chemical bonding viz.,Ionic, Covalent bonds with examples.

1.14   Explain bond formation in NaCl and MgO.

1.15   List Properties of Ionic compounds

1.16   Explain bond formation in Hydrogen molecule, Oxygen molecule, and Nitrogen molecule using Lewis dot method.

1.17   List Properties of Covalent compounds

1.18   Distinguish between properties of ionic compounds and covalent compounds.

1.19   Structures of ionic solids -define a) Unit cell b) co-ordination number.

1.20   Structures of Unit cells of NaCl and CsCl.

1.21   Define the term. Oxidation number.

1.22   Calculate the Oxidation Number of underlined atoms in the following examples

a)$K\underline{Mn}O_4$ b) $K_2\underline{Cr}_2O_7$ c) $H\underline{N}O_3$ d) $H_2\underline{S}O_4$ e) $\underline{Cl}O_4^-$ f) $\underline{N}H_4^+$

1.23   Differentiate between Oxidation Number and Valency

2.0   Calculate Molarity and Normality of given Solution

2.1   Define the terms 1.Solution, 2.Solute and 3.Solvent

2.2   Classify solutions based on physical state and solubility

2.3   Define mole

2.4   Problems on 'Mole concept'

2.5   Define the terms 1. Atomic weight, 2.Molecular weight and 3. Equivalent weight

2.6   Calculate Molecular weight and Equivalent weight of given   Acids,($HCl,H_2SO_4 HNO_3$) Bases (NaOH, KOH, $Ca(OH)_2$) and Salts (NaCl, Na_2CO_3, $CaCO_3$)

2.7   Define 1.Molarity, 2.Normality of solutions

2.8   Solve Numerical problems on Molarity and Normality

 a) calculate the Molarity or Normality if weight of solute and volume of solution are given

b) calculate the weight of solute if Molarity or normality with volume of solution are given

c) problems on dilution to convert high concentrated solutions to low concentrated solutions

3.0   Understand the concepts of Acids and bases

3.1   Explain Arrhenius theory of Acids and Bases

3.2   State the limitations of Arrhenius theory of Acids and Bases

3.3   Explain Bronsted–Lowry theory of acids bases

3.4   State the limitations of Bronsted–Lowry theory of acids bases

3.5   Explain Lewis theory of acids and bases

3.6   State the limitations of Lewis theory of acids and bases

3.7   Explain the Ionic product of water

3.8   Define pH and explain Sorenson scale

3.9   Solve the Numerical problems on pH (Strong Acids and Bases)

3.10   Define Buffer solution

3.11   Give atleast three examples for Buffer solutions

3.12   State the applications of Buffer solution

4.0   Understand the Principles of Metallurgy

4.1   List at least eight Characteristics of Metals

4.2   Distinguish between Metals and Non Metals

4.3   Define the terms 1.Mineral, 2.Ore, 3. Gangue, 4.Flux and 5.Slag

4.4   Describe the methods of concentration of Ore; 1.Hand picking, 2.Levigation, and 3. Froth Floatation

4.5   Describe the methods involved in extraction of crude metal- Roasting, Calcination and Smelting.

4.6   Explain the purification of Metals by Electrolytic Refining

4.7   Define an Alloy

4.8   Write the Composition of the following alloys:1.Brass, 2. Germansilver, 3 Nichrome

4.9   List the uses of the following Alloys: 1. Brass, 2. German silver, 3. Nichrome

5.0   Understand the concepts of Electrochemistry

5.1   Define the terms1. Conductor, 2. Insulator, 3.Electrolyte   4.Non–electrolyte

5.2   Distinguish between metallic conduction and Electrolytic conduction

5.3   Explain electrolysis by taking example fused NaCl

5.4   Explain Faraday's laws of electrolysis

5.5   Define 1. Chemical equivalent (E) 2. Electrochemical equivalent (e) and their relation.

5.6   Solve the Numerical problems based on Faraday's laws of electrolysis

5.7   Define Galvanic cell

5.8   Explain the construction and working of Galvanic cell

5.9   Distinguish between electrolytic cell and galvanic cell

5.10 Explain the electrode potentials and standard electrode potentials

5.11 Explain the electrochemical series and its significance

5.12 Explain the emf of a cell.

5.13 Solve the numerical problems on emf of the cell based on standard electrode potentials.

6.0   Understand the concept of Corrosion

6.1   Define the term corrosion

6.2   state the Factors influencing the rate of corrosion

6.3   Describe the formation of a)composition cell, b)stress cell, c)concentration cell during corrosion.

6.4   Define rusting of iron and Explain the mechanism of rusting of iron.

6.5   Explain the methods of prevention of corrosion:

   a)Protective coatings (anodic and cathodic coaitings)

   b) Cathodic protection (Sacrificial anode process and Impressed–voltage process)

7. 0   Understand the concept of Water Technology

7.1   State the various Sources of water like Surface water and sub-surface water.

7.2   Define the terms soft water and hard water with respect to soap consumption.

7.3   Define the term hardness of water

7.4   Types of hardness of water 1.Temporary hardness 2. Permanent hardness

7.5   List the salts that causing hardness of water(with Formulae)

7.6   State the disadvantages of using hard water in industries

7.7   Define Degree of hardness , units of hardness (mg/L) or ppm.

7.8   Explain the methods of softening of hard water: a) Ion-Exchange process, b) Permutit process or zeolite process

7.9   Concept of Osmosis and Reverse Osmosis with examples .

7.10   State the applications of Reverse Osmosis.

7.11 State essential qualities of drinking water.

8.0   Understand the concepts of Polymers

8.1   Explain the concept of polymerisation

8.2   Describe the methods of polymerization a) addition polymerization of Ethylene b)condensation polymerization of phenol and formaldehyde (Only flow chart i.e. with out chemical equations)

8.3   Define the term plastic

8.4   Classify the plastics with examples

8.5   Distinguish between thermo and thermosetting plastics

8.6   List the Characteristics of plastics

8.7   State the advantages of plastics over traditional materials

8.8   State the disadvantages of using plastics.

8.9   Explain the methods of preparation of the following plastics:

        1.Polythene, 2. PVC, 3.Teflon, 4. Polystyrene and 5. Urea formaldehyde

8.10   Explain the uses of the following plastics:

        1.Polythene, 2. PVC, 3.Teflon, 4.Polystyrene and 5. Urea formaldehyde

8.11   Define the term natural rubber

8.12   write the structural formula of Natural rubber

8.13   Explain the processing of Natural rubber from latex

8.14   List the Characteristics of natural rubber

8.15   Explain the process of Vulcanization

8.16   List the Characteristics of Vulcanized rubber

8.17   Define the term Elastomer

8.18   Describe the preparation of the following synthetic rubbers a) Buna-s and
        b)Neoprene rubber

8.19   List the uses of the following synthetic rubbers   a) Buna-s and b)Neoprene rubber

9.0   Understand the concepts of Fuels

9.1   Define the term fuel

9.2   Classify the fuels based on physical state–solid, liquid and gaseous fuels,

9.3   Classify the fuels based on occurrence-primary and secondary fuels

9.4   List the characteristics of good fuel

9.5   State the composition and uses of gaseous fuels:
        a)water gas,   b)producer gas, c)natural gas, d)coal gas, e)Biogas and f) acetylene

B.   ENVIRONMENTAL STUDIES

1.1   Define the term environment

1.2   Explain the scope and importance of environmental studies

1.3   Segments of environment 1).Lithosphere, 2).Hydrosphere, 3).Atmosphere,
        4).Biosphere,

1.4   Define the following terms 1)Pollutant, 2).Pollution, 3).Contaminant, 4) receptor, 5)
        sink, 6) particulates, 7) dissolved oxygen, 8)Threshold limitvalue, 9).BOD, and
        10).COD   11) eco system .

1.5   State the renewable and non renewable energy sources with examples.

1.6   Define the terms:

        1).Producers, 2).Consumers and 3).Decomposers with examples.

1.7   Explain biodiversity and threats to biodiversity

1.8   Define air pollution

1.9   Classify the air pollutants-based on origin and physical state of matter.

1.10 Explain the causes of Air pollution.

1.11 Explain the effects of air pollution on human beings, plants and animals.

1.12 State the uses of forest resources.

1.13 State the deforestation and its causes and effects.

1.14 Explain the 1.) Green house effect , 2) Ozone layer depletion and 3) Acid rain.

1.15 Explain the methods of control of Air pollution

1.16 Define Water pollution

1.17 Explain the causes of Water pollution

1.18 Explain the effects of Water pollution on living and Non-living things.

1.19 Explain the methods of control of Water pollution.

COURSE CONTENT

A.   ENGINEERINGCHEMISTRY

1.   Fundamentals of Chemistry

Atomic Structure: Introduction - Fundamental particles – Bohr's theory – Quantum numbers - Aufbauprinciple - Hund'srule - Pauli's exclusion Principle- Orbitals, shapes of s, p and d orbitals - Electronic configurations ofelements

Chemical Bonding: Introduction – types of chemical bonds – Ionic and covalent bond with examples–Properties of Ionic and Covalent compounds- structures of ionic crystals NaCl, CsCl.

,**Oxidation Number**- calculations, differences between Oxidation Number and Valency.

2.   Solutions

Introduction-concentration methods – Mole concept, Molarity, Normality, Equivalent weights, Numerical problems on Mole, Molarity and Normality.

3.   Acids and Bases

Introduction – Theories of acids and bases and limitations – Arrhenius theory- Bronsted –Lowry theory – Lewis acid base theory – Ionic product of water– pH and related numerical problems–Buffer solutions–Applications.

4.   Principles of Metallurgy

Characteristics of Metals and distinction between Metals and Non Metals, Metallurgy, ore, Gangue, Flux, Slag - Concentration of Ore –Hand picking, Levigation, Froth floatation – Methods of Extraction of crude Metal – Roasting, Calcination, Smelting – Alloys – Composition and uses of Brass, German silver and Nichrome

5. Electrochemistry

Conductors, insulators, electrolytes– electrolysis – Faraday's laws of electrolysis-numerical problems – Galvanic cell – standard electrode potential – electrochemical series– emf and numerical problems on emf of a cell

6. Water technology

Introduction – soft and hard water–causes of hardness–types of hardness –disadvantages of hard water – degree of hardness (ppm) – softening methods – permutit process – ion exchange process– drinking water –Osmosis, Reverse Osmosis – Applications of Reverse osmosis

7. Introduction - factors influencing corrosion - composition, stress and concentration cells–rusting of iron and its mechanism – prevention of corrosion by coating methods, cathodic protection

8. Polymers

Introduction – polymerization – types of polymerization – addition, condensation with examples – plastics – types of plastics – advantages of plastics over traditional materials –Disadvantages of using plastics – preparation and uses of the following plastics: 1.Polythene 2. PVC   3.Teflon 4. Polystyrene 5. Urea formaldehyde – Rubber – Natural rubber – processing from latex –Vulcanization – Elastomers, Buna-s, Neoprene rubber and their uses .

9. Fuels

Definition and clasification of fuels–characteristics of good fuel-composition and uses of gaseous fuels.

B.   ENVIRONMENTALSTUDIES

Introduction – environment – scope and importance of environmental studies important terms – renewable and non-renewable energy sources – Concept of ecosystem , producers, consumers and decomposers – Biodiversity, definition and threats to Biodiversity.

Air pollution – causes -Effects– forest resources: uses and over exploitation, deforestation, acid rain, greenhouse effect –ozone depletion – control of air pollution – Water pollution – causes – effects – control measures,

REFERENCEBOOKS

1.	Intermediate chemistry Vol 1&2	Telugu Academy
2.	Intermediate chemistry Vol 1&2	Vikram Publishers
3.	Intermediate chemistry Vol 1&2	Vignan Publishers &Deepthi Publishers
4.	Engineering Chemistry	Jain & Jain
5.	Engineering Chemistry	O.P. Agarwal, Hi-Tech.
6.	Engineering Chemistry	Sharma
7.	Engineering Chemistry	A.K. De

BASICS OF INFORMATION TECHNOLOGY

Subject : **Basics of Information Technology**
Subject Code : **IT - 105**
Periods per Week : **4**
Periods per Year : **120**

Unit No.	Major Topic	No. of periods	Weigtage of marks	Short Answer Questions	Essay Questions
1	Understand Fundamentals of Computer	15	13	1	1
2	Implement Programming Methodology.	5	3	1	0
3	Understand Number systems	10	8	1	½
4	Understand DOS Operating Systems	15	13	1	1
5	Understand Windows Operating Systems	20	16	2	1
6	Understand Features of Internet	25	26	2	2
7	Overview of Computer Topics	20	18	1	1½
8	Understand Emerging Trends in Information Technology	10	13	1	1
	Total	**120**	**110**	**10**	**8**

Objectives
   Upon completion of the course the student shall be able to

1.0   Understand Fundamentals of Computer
1.1.   Define various terms related to computers – Computer, Hardware, Software, Firmware, High Level Language , Low Level Language
1.2.   Draw the block diagram of a Computer.
1.3.   Describe the interaction between the CPU, Memory, Input / Output devices
1.4.   Describe the function of CPU and major functional parts of CPU
1.5.   Describe the function of memory.

1.6.   Describe the function of input/output devices.
1.7.   State the relevance of speed and word length for CPU Performance.
1.8.   Recognize the current family of CPUs used in Computers.
1.9.   State the use of storage devices used in a Computer.
1.10. List the two types of memory used in a Computer.
1.11. State the importance of cache memory.
1.12. Explain the generations of computers.
1.13. Give the classification of computers - based on a) size, b) processor.
1.14. State the importance of binary number system for use in Digital Computers.

2.0   Implement Programming Methodology
2.1.   State the different steps involved in problem solving.
2.2.   Define algorithm.
2.3.   List four characteristics of algorithm.
2.4.   Define a program.
2.5.   Differentiate between program and algorithm.
2.6.   State the steps involved in algorithm development.
2.7.   Differentiate algorithm and flowchart.
2.8.   Develop algorithms for simple problems.
2.9.   Draw the symbols used in flowcharts.
2.10. Draw flowcharts for simple problems.

3.0   Understand Number systems
3.1.   List the various number systems used in digital Computer.
3.2.   Convert decimal number into binary number.
3.3.   Convert binary number into decimal number.
3.4.   Convert binary number into hexadecimal number.
3.5.   Convert hexadecimal number into binary number.
3.6.   Explain the ASCII coding scheme.
3.7.   Explain the EBCDIC coding scheme.

4.0   Understand DOS Operating Systems
4.1.   Describe the need for an operating system.
4.2.   List the various operating systems used presently.
4.3.   DOS Prompt.
4.4.   Classify DOS commands.
4.5.   List and explain atleast 10 Internal Commands.
4.6.   List and explain atleast 5 External Commands .
4.7.   Explain directories and files.
4.8.   Know wild card characters.
4.9.   Describe Autoexec.bat and config.sys files.

5.0   Understand Windows Operating Systems
5.1.   List the features of Windows desktop.
5.2.   List the components of a Window.
5.3.   State the function of each component of a Window.
5.4.   Explain the Method of starting a program using start button .

5.5.   Explain usage of maximize, minimize, restore and close buttons.
5.6.   State the meaning of a file.
5.7.   State the meaning of a folder.
5.8.   Explain the Method of viewing the contents of hard disk drive using Explorer.
5.9.   Explain the Method of finding a file using search option.
5.10.   Describe installing new software using control panel.
5.11.   Describe uninstalling software using control panel.
5.12.   Explain installing a new hardware using control panel.
5.13.   Explain uninstalling a hardware using control panel.
5.14.   Narrate finding out drive space using system tool option of Accessories .
5.15.   Explain the procedure of disk defragmentation using System Tools.
5.16.   Narrate installing a printer using control panel.
5.17.   Explain the procedure for changing resolution, color, appearance, screen saver options of the display.
5.18.   Narrate the process of changing the system Date and Time

6.0   Understand Features of Internet
6.1.   Explain meaning of a Computer Network.
6.2.   Describe the concept of a Local Area Network (LAN).
6.3.   Explain the concept of the Wide Area Network (WAN).
6.4.   Compare Internet and Intranet.
6.5.   Describe the relevance of an internet service provider.
6.6.   Explain the role of a modem in accessing the Internet.
6.7.   Explain the installation procedure of a MODEM using control panel.
6.8.   Explain the purpose of Web Browser software.
6.9.   Explain the structure of a Universal Resource Locator (URL).
6.10.   Describe the purpose of World Wide Web, FTP, telnet and E-mail.
6.11.   Explain the process of sending and receiving E-mails
6.12.   Describe address format and IP address.
6.13.   Describe DNS.
6.14.   Explain the role of search engines with examples.
6.15.   Describe DHCP.
6.16.   Describe Social Network sites.
6.17.   Describe Internet Security.

7.0   Overview of Computer Topics
7.1.   Introduction to Data Structure.
        7.1.1. Define Data Structure .
        7.1.2. Classify Data Structure.
7.2.   Introduction to Database Management Systems.
        7.2.1. Define terms Database and Database Management Systems.
        7.2.2. List advantages of Database systems.
        7.2.3. Distinguish between Flat file database and Relational Database systems.
        7.2.4. List various existing Database systems.
7.3.   Introduction to Software Engineering.
        7.3.1. Define Software Engineering.
        7.3.2. Need for Software Engineering.
        7.3.3. List different life cycle models in software engineering.
7.4.   Introduction to Open Source Software.

7.4.1. Define Open Source software.

7.4.2. List any five Open Source softwares.

7.5. Introduction to System Administration.

7.5.1. List any five Networking Operating Systems.

7.5.2. Define Client and Server.

7.5.3. List and explain any five features of Networking operating system.

7.5.4. Differentiate between Networking O.S. and Desktop O.S.

7.5.5. Define File System.

7.5.6. List and explain file systems available FAT, FAT32 and NTFS.

8.0 Understand Emerging Trends in Information Technology

8.1. Introduction to Multimedia

8.1.1. Define Multimedia

8.1.2. Uses of Multimedia

8.1.3. List any five applications of Multimedia

8.1.4. Explain the need for photo shop & flash

8.2. Introduction to Network Security

8.2.1. Define Virus

8.2.2. Define Worm

8.2.3. Define Cyber Crime

8.2.4. Need for Network Security

8.2.5. Know about Encryption

8.3. Introduction to E-Commerce

8.3.1 Define E-Commerce

8.3.2 Types of E-commerce sites

8.3.3 Explain various security concerns

COURSE CONTENT

1.0 Fundamentals of Digital Computer

Block diagram of a digital computer, functional parameters of CPU, Clock Speed and Word Length, Functional blocks of a CPU: ALU and Control Unit, types of memory RAM, ROM, purpose of cache memory, generations of computers, classification of computers , Importance of Binary Number System.

2.0 Programming Methodology.

Steps involved in problem solving - Define Algorithm , Program - Characteristics of algorithm - Differentiate between program and algorithm- Steps involved in algorithm development - Differentiate algorithm and flowchart - Algorithms for simple problems - Symbols used in flowcharts - Flowcharts for simple problems.

3.0 Number Systems

Number Systems, Decimal, Binary, Hexadecimal and Octal codes, Conversion from one number system to another number system, ASCII, BCD and EBCDIC code for characters, concept of a byte and word.

4.0 DOS Operating Systems

Need for an Operating System - List the various Operating Systems - Prompt, Types of commands, Internal & External Commands - Directories and files, wild cards, autoexec.bat, config.sys

5.0 Windows Operating Systems

Features of Windows desktop - Components of a Window - Function of each component of a Window - Method of starting a program using start button -Maximize, minimize, restore down and close buttons- Meaning of a file and flolder -Viewing the contents of hard disk drive using explorer -Finding a file - Formatting a floppy disk using explore option - Installing and uninstalling new software using control panel - installing and un inistalling a new hardware using control panel - Drive Space - Disk Defragmentation - Installing a printer - Changing resolution, colour, appearance and screen saver options of the display - Changing the system Date and Time.

6.0 Features of Internet

Computer Networks -Local Area Network - Wide Area Network - Compare Internet & Intranet - Internet Service Provider- Role of a modem in accessing the Internet-Installation of a MODEM using control panel - Web browser software - Structure of a Universal Resource Locator - World Wide Web, FTP, telnet and E-mail -Sending and Receiving E-mails - Connection methods - Address format and IP address - DNS – DHCP- Role of search engines with examples- Differences between search engines and directory - Social Network sites - Internet Security

7.0. Overview of Computer Topics

Introduction to Data Structure - Introduction to Database Management System Introduction to Software Engineering - Introduction to Open Source Software - Introduction to System Administration.

8.0 Emerging Trends in Information Technology

Introduction to multimedia - Introduction to Network Security - Introduction to E-Commerce

REFERENCE BOOKS

1. Information Technology   - Curtin.
2. Computer Science Theory & Application - E. Balaguruswamy, B. Sushila
3. Introduction to Computers (Special Indian Edition) - Peter Norton

PROGRMMING IN C

Subject	: **Programming in C**
Subject Code	: **IT- 106**
Periods per Week	: **4**
Periods per Year	: **120**

Unit No	Major Topic	No of Periods	Weightage of marks	Short Answer Questions	Essay Questions
1	Introduction to C Language	4	3	1	0
2	Constants, Variables and Data Types in C	5	3	1	0
3	Operators and Expressions in C	10	5	0	½
4	Managing Input and Output Operations	4	3	1	0
5	Decision making	11	13	1	1
6	Looping concepts	11	13	1	1
7	Arrays	15	13	1	1
8	Strings	6	3	1	0
9	User defined functions	20	18	1	1½
10	Basics of Pointers	12	13	1	1
11	Basics of Structures and Unions	10	10	0	1
12	Basics of Files management and Preprocessor directives	12	13	1	1
	Total	**120**	**110**	**10**	**8**

Objectives
   Upon completion of the course the student shall be able to

1.0   Introduction to C Language
   1.1 Define High level language and low level language
   1.2 Describe the history of C language
   1.3 State the importance of C language
   1.4 Explain the structure of C language
   1.5 Describe the programming style of C language
   1.6 Explain the steps involved in executing the C program

2.0   Understand Constants, Variables and Data Types in C
   2.1 Describe character set.
   2.2 Explain C Tokens
   2.3 Describe Keywords and Identifiers
   2.4 Explain Constants and Variables
   2.5 Define Data Type
   2.6 Classify Data Types and explain them with examples.
   2.7 Explain declaration of a variable
   2.8 Explain assigning values to variable

3.0   Understand Operators and Expressions in C
   3.1 Define an operator
   3.2 Define an expression
   3.3 Classify operators
   3.4 Explain various arithmetic operators with examples
   3.5 Illustrate the concept of relational operators
   3.6 Explain logical operators
   3.7 Describe various assignment operators
   3.8 Illustrate nested assignment
   3.9 Describe increment and decrement operators
   3.10 Illustrate conditional operator
   3.11 Explain bitwise operators
   3.12 Explain special operators
   3.13 Illustrate arithmetic expressions
   3.14 Describe precedence and associativity of operators
   3.15 Describe evaluation of expressions
   3.16 Illustrate type conversion techniques and discuss them

4.0   Understand Input and Output Operations
   4.1 Illustrate reading a character using getchar()
   4.2 Illustrate writing a character using putchar()
   4.3 Illustrate formatted input using scanf()
   4.4 Write sample programs for formatted input using scanf()
   4.5 Illustrate formatted output using printf()
   4.6 Write sample programs for formatted output using printf()
   4.7 Illustrate Preprocessor Directive #include

5.0   Understand Decision making
   5.1 Discuss decision making in programming
   5.2 Explain decision making statements
   5.3 Describe relational operators with their precedence
   5.4 Explain logical operators and their precedence
   5.5 Explain how to evaluate a logical expression.
   5.6 Discuss about simple if statement with syntax and sample program
   5.7 Discuss about nested if..else statements with syntax and sample program
   5.8 Discuss about else if ladder with syntax and sample program
   5.9 State the importance of indentation
   5.10   Discuss about switch statement with syntax and sample program
   5.11   Illustrate conditional operator

6.0   Understand Looping concepts
   6.1 Define looping
   6.2 List at least three loop statements
   6.3 Explain while statement with syntax and sample program
   6.4 Explain do.. while statement with syntax and sample program
   6.5 Explain 'for' loop statement with syntax and sample program
   6.6 Define nesting of loops and implement it
   6.7 Compare different loop statements
   6.8 Differentiate break and continue statements.
   6.9 Define structured programming

7.0   Understand Arrays
7.1 Define Array
7.2 Describe declaration and initialization of One Dimensional Array with syntax and sample programs.
7.3 Explain accessing the elements in the Array with sample programs.
7.4 Explain reordering an array in ascending order .
7.5 Explain declaration and initialization of two Dimensional Arrays.
7.6 Illustrate the concept of arrays with sample programs on matrix addition and matrix multiplication

8.0   Understand Strings
8.1 Define String
8.2 Know about declaration and initialization of String variables.
8.3 Know about reading of strings from terminal with sample programs.
8.4 Know about writing strings to screen with sample programs.
8.5 Explain about various String handling functions with sample programs.
8.6 Explain Arithmetic operations on Characters.

9.0   Understand User defined functions
9.1 Define function.
9.2 State the need for user defined functions
9.3 Discuss the advantages of the functions
9.4 Discuss the elements of function
9.5 Discuss about return values and their types
9.6 Define a function call
9.7 Define function prototype
9.8 Illustrate function declaration in programs
9.9 Discuss and illustrate functions with no arguments and no return values with sample programs
9.10   Discuss and illustrate functions with arguments with no return values with sample programs
9.11   Discuss and illustrate functions with arguments with return values with sample programs
9.12   Discuss and illustrate functions with no arguments with return values with sample programs
9.13   Illustrate functions that return multiple values with sample programs
9.14   Define recursion
9.15   Illustrate recursion with sample programs
9.16   Illustrate passing arrays to functions with sample programs
9.17   Discuss the scope, visibility and lifetime of variables in functions
9.18   Differentiate Local and External variables
9.19   Define Global variable
9.20   Discuss passing the global variables as parameters using sample programs

10.0   Understand basics of Pointers

10.1   Define Pointer
10.2   Illustrate declaration and initialization of Pointers.
10.3   Illustrate accessing the address of a variable using & operator
10.4   Illustrate accessing the value of a variable through pointer
10.5   Differentiate between address and de-referencing operators.
10.6   Discuss about pointer arithmetic.
10.7   Illustrate precedence of address and de-referencing operators.
10.8   Discuss the pointer comparison and pointer conversion.
10.9   Illustrate relationship between arrays and pointers.
10.10 Illustrate accessing array elements using pointers
10.11 Illustrate use of pointers as function arguments
10.12 Discuss pointer arrays with examples.
10.13 Explain dynamic memory management functions and illustrate with examples.

11.0   Understand basics of Structures and Unions

11.1   Define a structure.
11.2   Illustrate creating a structure
11.3   Illustrate declaring structure variables
11.4   Explain accessing of the structure members
11.5   Explain array of structures
11.6   Illustrate concept of structure assignment.
11.7   Explain how to find size of a structure.
11.8   Discuss nested structure concept.
11.9   Illustrate use of pointer to structure.
11.10 Illustrate structure as function arguments and structures as function values.
11.11 Illustrate the Structures containing arrays, arrays of structures containing arrays
11.12 Illustrate concept of structures containing pointers.
11.13 Explain Self referential structures with examples.
11.14 Define Union and illustrate use of a union.
11.15 Differences between Structures and Union

12.0   Understand basics of Files management and Preprocessor directives

12.1 Define file
12.2 Know how to declare file pointer to a file
12.3 Illustrate the concept of file opening in various modes
12.4 Illustrate the concept of closing of a file
12.5 Illustrate the concept of Input / Output operations on a file
12.6 Illustrate the concept of random access to files
12.7 State the need of Preprocessor directives
12.8 Explain Preprocessor directives
12.9 Explain macro substitution using #define with an example

COURSE CONTENT

1.   **Introduction to C Language**
        Define High level language and low level language-history of C language -
        importance of C language - structure of C language - programming style of C
        language - steps involved in executing the C program

2.   **Understand Constants, Variables and Data Types in C**
        character set - C Tokens - Keywords and Identifiers- Constants and Variables
        - Data Types and classification - declaration of a variable - Assigning values to
        variables

3.   **Understand Operators and Expressions in C**
        Define an operator - Define an expression -Classify operators - List and explain
        various arithmetic operators with examples -Illustrate the concept of relational
        operators - List logical operators - various assignment operators - Nested
        assignment - Increment and decrement operators - Conditional operator - List
        bitwise operators -List various special operators- Arithmetic expressions-
        precedence and associativity of operators- Evaluation of expressions - Various
        type conversion techniques and discuss them.

4.   **Managing Input and Output Operations**
        reading and writing characters - formatted input and output -Preprocessor
        Directive #include

5.   **Understand Decision making**
        Decision making in programming - Relational operators with their precedence -
        Logical operators and their precedence -Evaluate a logical expression -
        simple if statement with sample program- else if, nested if , else if ladder,
        switch statements.

6   **Understand Looping concepts**
        Classification of various loop statements- while statement – do.. while
        statement ram - for loop statement - nesting of loops- Comparisons of
        different loop statements - break and continue statements -   structured
        programming

7   **Understand Arrays**
        Arrays -declaration and initialization of One Dimensional Array Accessing the
        elements in the Array - Reordering an array in ascending order - Declaration
        and initialization of two Dimensional Arrays - sample programs on matrix
        addition and matrix multiplication

8   **Understand Strings**
         Strings - Declaration and initialization of a String variables -   Reading
        of strings from terminal - writing strings to screen - String handling
        functions with sample programs - Arithmetic operations on Characters

9   **Understand User defined functions**
Function -Need for user defined functions - Advantages of functions - elements of function - Return values and their types - function call - function prototype - Functions with no arguments and no return values - functions with arguments with no return values - functions with arguments with return values - functions with no arguments with return values - functions that return multiple values Recursion - sample programs on recursion - passing arrays to functions Scope, visibility and lifetime of variables in functions- Local and External variables -Global variable- passing the global variables as parameters

10   **Understand basics of Pointers**
Pointer - Declaration and Initialization of Pointers- Accessing the address of a variable using & operator- Accessing a value of a variable through pointer - Differentiate address and de-referencing operators - Pointer Arithmetic- precedence of address and de-referencing operators - pointer comparison and pointer conversion -Relationship between Arrays and Pointers - Accessing array elements using pointers- Pointers as Function Arguments - Discuss pointer Arrays with examples- Dynamic memory management functions

11   **Understand basics of Structures and Unions**
Structure- Creating a structure - Declaring structure variables -Accessing the structure members - Array of structures - Concept of structure assignment -Find size of a structure - Nested structure concept - Concept of pointer to structure - Structure as function arguments and structures as function values - Structures containing arrays, arrays of structures containing arrays - Concept of structures containing pointers - Self referential structures with examples - Union and illustrate use of a union – difference between Structures and Union

12   **Understand basics of Files management and Preprocessor directives**
File - Declare file pointer to a file - file opening in various modes - Concept of closing of a file - Input / Output operations on a file - Random access to files - Need of Preprocessor directives - Various Preprocessor directives- Macro substitution using #define

REFERENCE BOOKS

1	Programming in ANSI C	E. Balaguruswamy	Tata McGrawHill
2	Programming with C	Gottfried	Schaum'outline Tata McGraw Hill
3	C The complete Reference	Schildt	Tata McGraw Hill

ENGINEERING DRAWING

(Common to all Branches)

Subject Title	:	Engineering Drawing	
Subject Code	:	IT- 107	
Periods/Week	:	06	
Periods Per Year	:	180	

Time Schedule

Sno	Major Topics	No. of Periods	Weightage of marks	Short Answer Questions	Essay type Questions
1	Importance of Engineering Drawing	01	-	-	-
2	Engineering Drawing Instruments	05	-	-	-
3	Free hand lettering & Numbering	06	5	1	-
4	Dimensioning Practice	09	5	1	-
5	Geometrical Constructions	21	15	1	1
6	Projection of points, Lines, Planes & Solids	21	10	-	1
7	Auxiliary views	06	5	1	-
8	Sectional views	27	10	-	1
9	Orthographic Projection	33	10	-	1
10	Pictorial drawing	30	10	-	1
11	Development of surfaces	21	10	-	1
	Total	**180**	**80**	**04**	**06**

The course is aimed at developing basic graphic skills so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation

OBJECTIVES

Upon completion of the subject the student shall be able to

1) **Understand the basic concepts of Engineering Drawing**
   a) State the importance of drawing as an engineering communication medium
   b) State the necessity of B.I.S. Code of practice for Engineering Drawing
   c) Explain the linkages between Engineering drawing and other subjects of study in diploma course
2) **Use of Engineering Drawing Instruments**
   a) Select the correct instruments and draw lines of different orientation
   b) Select the correct instruments and draw small and large Circles
   c) Select the correct instruments for measuring distances on the drawing
   d) Use correct grade of pencil for different types of lines, thickness and given function
   e) Select and use appropriate scales for a given application

f) Identify different drawing sheet sizes as per I.S. and Standard Layouts
g) Prepare Title block as per B.I.S. Specifications
h) Identify the steps to be taken to keep the drawing clean and tidy

3) Write Free Hand Lettering and Numbers
a) Write titles using slanting letters and numerals of 7mm, 10mm and 14mm height
b) Write titles using vertical letters and numerals of 7mm, 10mm and 14mm height
c) Select suitable sizes of lettering for different layouts and applications

4) Understand Dimensioning Practice
a) Define "Dimensioning"
b) State the need of dimensioning the drawing according to accepted   standards
c) Identify notations of Dimensioning used in dimensioned drawing
d) Identify the system of placement of dimensions in the given dimensioned drawing
e) Dimension a given drawing using standard notations and desired system of dimensioning
f) Dimension standard features applying necessary rules
g) Arrange dimensions in a desired method for a given drawing
h) Identify the departures if any made in the given dimensioned drawing with reference to SP-46-1988, and dimension the same correctly

5) Apply Principles of Geometric Constructions
a) Divide a given line into desired number of equal parts internally
b) Draw tangent lines and arcs
c) Use General method to construct any polygon
d) Explain the importance of conics
e) Construct ellipse by concentric circles method
f) Construct parabola by rectangle method
g) Construct rectangular hyperbola from the given data
h) Construct involute from the given data
i) Construct cycloid and helix from the given data
j) State the applications of the above constructions in engineering practice

6) Apply Principles of Projection of points, lines, planes & solids
a) Visualize the objects
b) Explain the I-angle and III-angle projections
c) Practice the I-angle projections
d) Draw the projection of a point with respect to reference planes (HP&VP)
e) Draw the projections of straight lines with respect to two reference planes (cases of lines parallel to one plane and inclined to other plane only)
f) Draw the projections of planes (cases of planes perpendicular to one plane and inclined to other plane only)
g) Draw the projections of solids (cases of axis perpendicular to one plane and inclined to other plane only)

7) Understand the need of auxiliary views
a) State the need of Auxiliary views for a given engineering drawing
b) Draw the auxiliary views of a given engineering component
c) Differentiate between auxiliary view and apparent view

8) Appreciate the need of Sectional Views
    a) Explain the need to draw sectional views
    b) Select the section plane for a given component to reveal maximum information
    c) Explain the positions of section plane with respect to reference planes
    d) Differentiate between true shape and apparent shape of section
    e) Draw sectional views and true sections of regular solids discussed in chapter-6 above
    f) Apply principles of hatching

9) Apply principles of orthographic projection
    a) Explain the principles of orthographic projection with simple sketches
    b) Draw the orthographic view of an object from its pictorial drawing
    c) Draw the minimum number of views needed to represent a given object fully

10) Prepare pictorial drawings
    a) State the need of pictorial drawings
    b) Differentiate between isometric scale and true scale
    c) Prepare Isometric views for the given orthographic drawings

11) Interpret Development of surfaces of different solids
    a) State the need for preparing development drawing
    b) Prepare development of simple engineering objects (cubes, prisms, cylinders, cones, pyramids) using parallel line and radial line methods
    c) Prepare development of surface of engineering components like trays, funnels, 90^0 elbows & rectangular ducts

COURSE CONTENT

NOTE
    1)   B.I.S Specifications should invariably be followed in all the topics.
    2)   A-3 Size Drawing Sheets are to be used for all Drawing Practice Exercises.
    3)   First Angle Projection is to be followed for all Orthographic projection exercises

1) The importance of Engineering Drawing
    Explanation of the scope and objectives of the subject of Engineering Drawing, Its importance as a graphic communication -Need for preparing drawing as per standards – SP-46–1988 – Mention B.I.S - Role of drawing in engineering education – Link between Engineering drawing and other subjects of study

2) Engineering drawing Instruments
    Classification: Basic tools, tools for drawing straight lines, tools for curved lines, tools for measuring distances and special tools like mini drafter & drafting machine – Mention the names under each classification and their brief description -Scales: Recommended scales reduced & enlarged scales-Lines: Types of lines, selection of line thickness - Selection of Pencils -Sheet Sizes: A0, A1, A2, A3, A4, A5, Layout of drawing sheets in respect of A0, A1, A3 sizes, Sizes of the Title block and its contents - Care and maintenance of Drawing Sheet

Drawing Plate 1: Consisting of two exercises on use of drawing instruments

3) **Free hand lettering & numbering**

Importance of lettering – Types of lettering -Guide Lines for Lettering- Practicing letters & numbers of given sizes (7mm, 10mm and 14mm) Advantages of single stroke or simple style of lettering

Drawing plate 2: Consisting of five to six exercises on freehand Lettering & Numbering

4) **Dimensioning practice**

Purpose of engineering Drawing, Need of B.I.S code in dimensioning -Shape description of an Engineering object - Dimensioning size, Location features, surface finish, fully dimensioned Drawing - Notations or tools of dimensioning, dimension line, extension line, leader line, arrows, symbols, number and notes, rules to be observed in the use of above tools - Placing dimensions: Aligned system and unidirectional system (SP-46- 1988) - Arrangement of dimensions: Chain, parallel, combined, progressive, and dimensioning by co-ordinate methods - The rules for dimensioning standard features Circles (holes) arcs, angles, tapers, chamfers, and dimensioning of narrow spaces

Drawing Plate 3: Consisting of 8 exercises on Dimensioning methods and rules

5) **Geometric Constructions**

Division of a line: to divide a straight line into given number of equal parts internally and it's examples in engineering applications. Construction of tangent lines: to draw tangent lines touching circles internally and externally. Construction of tangent arcs i) To draw tangent arc of given radius to touch two lines inclined at given angle (acute, right and obtuse angles) ii) Tangent arc of given radius touching a circle or an arc and a given line iii) Tangent arcs of radius R, touching two given circles internally and externally Construction of polygon: Construction of any regular polygon of given side using general method. Conical Curves: Explanation of Ellipse, Parabola, Hyperbola, as sections of a double cone and loci of a moving point, Eccentricity of above curves – Their Engg. applications viz. Projectiles, reflectors, P-V Diagram of a Hyperbolic process - Construction of ellipse by concentric circles method - Construction of parabola by rectangle method - Construction of rectangular hyperbola - General Curves: Involute, Cycloid and Helix, explanations as locus of a moving point, their engineering applications, viz, Gear tooth profile, screw threads, springs etc. - their construction.

Drawing Plate 4: Consisting of eight exercises on construction of polygons

Drawing Plate 5: Consisting of eight exercises on construction of conics

Drawing Plate 6: Consisting of eight exercises on involute, cycloid and helix

6) **Projection of points, lines, planes & solids**

Projecting a point on two planes of projection -Projecting a point on three planes of projection - Projection of straight line i) Parallel to both the planes ii) Perpendicular to one of the planes iii) Inclined to one plane and parallel to other plane - Projection of regular planes- i) Plane perpendicular to HP and parallel to VP and vice versa ii) Plane perpendicular to HP and inclined to VP and vice versa - Projection of regular solids with i) Axis perpendicular to one of the planes ii) Axis parallel to VP and inclined to HP and vice versa

Drawing Plate 7: Consisting of eight exercises on projection of points and Lines

Drawing Plate 8: Consisting of eight exercises on projection of planes

Drawing Plate 9: Consisting of eight exercises on projection of solids

7) **Auxiliary views**

Need for drawing auxiliary views - Explanation of the basic principles of drawing auxiliary views, explanation of reference plane and auxiliary plane - Partial auxiliary view.

Drawing plate 10: Consisting of four exercises on auxiliary views

8) **Sectional views**

Need for drawing sectional views – what is a sectional view - Location of cutting plane – Purpose of cutting plane line – Selection of cutting plane to give maximum information (vertical and offset planes) - Hatching – Section of regular solids inclined to one plane and parallel to other plane

Drawing Plate 11: Consisting of six exercises on sections of solids

9) **Orthographic Projections**

Meaning of orthographic projection -Using a viewing box model – Number of views obtained on the six faces of the box, - Legible sketches of only 3 views for describing object - Concept of front view, top view, and side view, sketching these views for number of engineering objects - Explanation of first angle projection. – Positioning of three views in First angle projection - Projection of points as a means of locating the corners of the surfaces of an object – Use of mitre line in drawing a third view when other two views are given - Method of representing hidden lines - Selection of minimum number of views to describe an object fully

Drawing Plate 12: Consisting of 12 exercises on orthographic projections of engineering objects

10) **Pictorial Drawings**

Brief description of different types of pictorial drawing viz., Isometric, oblique, and perspective and their use - Isometric drawings: Iso axis, angle between them, meaning of visual distortion in dimensions - Need for an isometric scale, difference between Isometric scale, and ordinary scale- difference between Isometric view and Isometric projection - Isometric and Non-isometric lines - Isometric drawing of common features like rectangles, circular shapes, non-isometric lines - Use of box and offset methods

Drawing plate 13: Consisting of 12 exercises on Isometric views of engineering objects

11) Development of Surfaces

Need for preparing development of surface with reference to sheet metal work -Concept of true length of a line with reference to its orthographic projection when the line is (i) parallel to the plane of projection (ii) inclined to one principal plane and parallel to the other -Development of simple solids like cubes, prisms, cylinders, cones, pyramids -Types of development: Parallel line and radial line development -Procedure of drawing development - drawings of trays, funnels, 90^0 elbow pipes and rectangular ducts.

Drawing plate 14: Consisting of 5 exercises on development problems

REFERENCE BOOKS

Engineering Graphics by P I Varghese – (McGraw-hill)

Engineering Drawing by Basant Agarwal & C.M Agarwal - (McGraw-hill)

Engineering Drawing by N.D.Bhatt.

T.S.M. & S.S.M on " Technical Drawing" prepared by T.T.T.I., Madras.

SP-46-1998 – Bureau of Indian Standards.

C PROGRAMMING LABORATORY

Subject Title   :   **C Programming Laboratory**
Subject Code   :   **IT - 108**
Periods per Week   :   **6**
Periods per Year   :   **180**

LIST OF EXPERIMENTS
1. Exercise on structure of C program
2. Exercise on Keywords and identifiers
3. Exercise on constants and variables
4. Execution of simple C program
5. Exercise on operators and expressions
6. Exercise on special operators
7. Exercise on input and output of characters
8. Exercise on formatted input and output
9. Exercise on simple if statement
10. Exercise on if..else statement
11. Exercise on else..if ladder statement
12. Exercise on switch statement
13. Exercise on conditional operator
14. Exercise on while statement
15. Exercise on for statement
16. Exercise on do..while statement
17. Exercise on one dimensional arrays
18. Exercise on two dimensional arrays
19. Exercise on strings
20. Exercise on user-defined function
21. Exercise on recursion
22. Exercise on structure
23. Exercise on array of structures
24. Exercise on pointers
25. Exercise on text files

The competencies and key competencies to be achieved by the student

S.No.	Name of the experiment	Objectives	Key Competencies
1	Exercise on structure of C program	For a given C program, identify the different building blocks	❖ Identify different building block in a C program
2	Exercise on Keywords and identifiers	For a given C program identify the keywords and identifiers	❖ Identify different keywords ❖ Check whether the keywords are in lowercase ❖ Differentiate identifiers and keywords
3	Exercise on constants and variables	For a given C program identify the constants and variables	❖ Identify the constants ❖ Identify the variables ❖ Declare variables with proper names ❖ Know the assignment of values to variables
4	Execution of simple C program	Execute a simple C program	❖ Acquaint with C program editing ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program
5	Exercise on operators and expressions	Write a C program that uses different arithmetic operators	❖ Identify different arithmetic operators ❖ Build arithmetic expressions ❖ Identify the priorities of operators ❖ Evaluate arithmetic expression ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program ❖ Check the output for its correctness
6	Exercise on special operators	Write a C program that uses special operators	❖ Identify different special operators ❖ Build expressions using special operators ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program ❖ Check the output for its correctness
7	Exercise on input and output of characters	Write a C program for reading and writing characters	❖ Know the use of getchar() function ❖ Know the use of putchar() function ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program ❖ Check whether the correct output is printed for the given input ❖

8	Exercise on formatted input and output	Write a C program using formatted input and formatted output	❖ Know the use of format string for different types of data in scanf() function ❖ Know the use of format string for different types of data in printf() function ❖ Check whether the data is read in correct format ❖ Check whether the data is printed in correct format
9	Exercise on simple if statement	Write a C program using simple if statement	❖ Build a relational expression ❖ Use the if statement for decision making ❖ Rectify the syntax errors ❖ Check the output for correctness
10	Exercise on if..else statement	Write a C program using if..else statement	❖ Build a relational expression ❖ Use the if..else statement for decision making ❖ Rectify the syntax errors ❖ Check the output for correctness
11	Exercise on else..if ladder statement	Write a C program using else..if ladder statement	❖ Use else..if ladder statements with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check the output for correctness
12	Exercise on switch statement	Write a C program using switch statement	❖ Use switch statement with correct syntax ❖ Identify the differences between switch and else..if ladder ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check the output for correctness
13	Exercise on conditional operator	Write a C program using (? :) conditional operator	❖ Build the three expressions for conditional operator ❖ Use conditional operator with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Differentiate conditional operator and if..else statement
14	Exercise on while statement	Write a C program using while statement	❖ Build the termination condition for looping ❖ Use while statement with correct syntax ❖ Check whether correct number of iterations are performed by the while loop ❖ Rectify the syntax errors ❖ Debug logical errors

15	Exercise on **for** statement	Write a C program using for statement	❖ Build the initial, increment and termination conditions for looping ❖ Use for statement with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check whether correct number of iterations are performed by the **for** loop ❖ Differentiate **for** and **while** statements
16	Exercise on **do..while** statement	Write a C program using do statement	❖ Build the termination condition for looping ❖ Use do statement with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check whether correct number of iterations are performed by the while loop ❖ Differentiate **do..while,while** and **for** statements
17	Exercise on one dimensional arrays	Write a C program to create and access one dimensional array	❖ Create a one dimensional array with correct syntax ❖ Store elements into array ❖ Read elements from array ❖ Validate boundary conditions while accessing elements of array ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
18	Exercise on two dimensional arrays	Write a C program to create and access two dimensional array	❖ Create a two dimensional array with correct syntax ❖ Store elements into array ❖ Read elements from array ❖ Validate boundary conditions while accessing elements of array ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
19	Exercise on strings	Write a C program for reading and writing strings	❖ Declare and initialize string variables ❖ Read strings from keyboard ❖ Print strings to screen

20	Exercise on user-defined function	Write a C program to define and call user-defined functions	❖ Identify the different parts of function declaration ❖ Define function with correct syntax ❖ Classify functions based on it parameters and return types ❖ Identify parameters passed ❖ Identify parameter passing method used ❖ Identify return value ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
21	Exercise on recursion	Write a C program using recursion	❖ Identify where recursive call is made in the function ❖ Validate the termination condition ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
22	Exercise on structure	Write a C program using structure	❖ Define a structure with correct syntax ❖ Identify different members of a structure ❖ Declare a structure variable ❖ Access different members of structure ❖ Observe the size of the structure ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
23	Exercise on array of structures	Write a C program to create an array of structures and store and retrieve data from that array	❖ Define a structure with correct syntax ❖ Identify different members of a structure ❖ Declare a structure variable ❖ Create an array of structure ❖ Access individual element of the array of structure ❖ Access different members of structure ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input

24	Exercise on pointers	Write a C program using pointer data type	❖ Declare pointer variable ❖ Initialize pointer variable ❖ Access a variable through its pointer ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
25	Exercise on text files	Write a C program to create a text file, write data into it and read data from it	❖ Define a file pointer ❖ Use the various modes of file opening ❖ Close the file ❖ Write text into file ❖ Read text from file ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input

PHYSICS LABORATORY
(Common to all Branches)

Subject Title : **Physics Laboratory**
Subject Code : **IT -109**
Periods per week : **03**
Total periods per year : **45**

TIME SCHEDULE

S.No	Name of the Experiment	No. of Periods
1.	Hands on practice on Vernier Calipers	03
2.	Hands on practice on Screw gauge	03
3.	Verification of Parallelogram law of forces and Triangle law of forces	03
4.	Simple pendulum	03
5.	Velocity of sound in air – (Resonance method)	03
6.	Focal length and Focal power of convex lens (Separate & Combination)	03
7.	Refractive index of solid using traveling microscope	03
8.	Surface tension of liquid using traveling microscope	03
9.	Coefficient of viscosity by capillary method	03
10.	Boyle's law verification	03
11.	Meter bridge	03
12.	Mapping of magnet lines of force	03
	Revision	06
	Test	03
	Total:	**45**

Objectives:
Upon completion of the course the student shall be able to

1.0 Practise with Vernier calipers to determine the volumes and areas of a cylinder and sphere and their comparison etc .
2.0 Practise with Screw gauge to determine thickness of a glass plate, cross sectional area of a wire and volumes of sphere and also their comparison etc
3.0 Verify the parallelogram law and Triangle law
4.0 Determine the value of acceleration due to gravity using Simple Pendulum
5.0 Determine the velocity of sound in air at room temperature and its value at zero degree centigrade
6.0 Calculate the Focal length and focal power of convex lenses using distant object method , U-V method , U-V graph and $1/U – 1/V$ graph methods and their comparison,
7.0 Determine the refractive index of a solid using travelling microscope

8.0   Determine the surface tension of a liquid using travelling microscope
9.0   Determine the viscosity of a liquid using capillary method
10.0 Verify the Boyle's law employing a Quill tube
11.0 Determine the specific resistance of material of a wirel using Meter Bridge
12.0   Drawing magnetic lines of force under N-S and N-N methods and locate null points

Competencies and Key competencies to be achieved by the student

Name of the Experiment	Competencies	Key competencies
1. Hands on practice on Vernier Calipers(03)	• Find the Least count • Fix the specimen in posit • Read the scales • Calculate the physical quantities of given object	• Read the scales • Calculate the requisite physical quantities of given objects
2. Hands on practice on Screw gauge(03)	• Find the Least count • Fix the specimen in posit • Read the scales • Calculate thickness of glass place and cross section of wire and other quantities	• Read the scales • Calculate thickness of given glass plate • Calculate cross section of wire and other quantities
3. Verification of Parallelogram law of forces and Triangle law of forces(03)	• Fix suitable weights • Note the positions of threads on drawing sheet • Find the angle at equilibrium point • Construct parallelogram • Compare the measured diagonal • Construct triangle • Find the length of sides • Compare the ratios	• Find the angle at equilibrium point • Constructing parallelogram • Construct triangle • Compare the ratios of force and length
4. Simple pendulum(03)	• Fix the simple pendulum to the stand • Adjust the length of pendulum • Find the time for number of	• Find the time for number of oscillations • Find the time period • Calculate the acceleration due to gravity • Draw l-T and l-T^2

5. Velocity of sound in air –Resonance method (03)	• Arrange the resonance apparatus • Adjust the reservoir level for booming sound	• Adjust the reservoir level • Find the first and second resonanting lengths
6. Focal length and Focal power of convex lens (Separate & Combination) (03)	• Fix the object distance • Find the Image distance • Calculate the focal	• Calculate the focal length and power of convex lens • Draw u-v and 1/u – 1/v graphs
7. Refractive index of solid using traveling microscope(03)	• Find the least count of vernier on microscope • Place the graph paper below microscope • Read the scale • Calculate the refractive index of glass slab	• Read the scale • Calculate the refractive index of glass slab
8. Surface tension of liquid using traveling microscope(03)	• Find the least count of vernier on microscope • Focus the microscope to the lower meniscus & bent pin • Read the scale • Calculate height of liquid rise • Calculate the surface	• Read the scale • Calculate height of liquid rise • Calculate the surface tension of water
9. Coefficient of viscosity by capillary method(03)	• Find the least count of vernier • Fix the capillary tube to aspiratory bottle • Find the mass of collected water • Find the pressure head	• Find the pressure head • Calculate rate of volume of liquid collected • Find the radius of capillary tube

10. Boyle's law verification (03)	• Note the atmospheric pressure • Fix the quill tube to retort stand • Find the length of air column • Find the pressure of enclosed air • Find and compare the calculated value P x l	• Find the length of air column • Find the pressure of enclosed air • Find the value P x l
11. Meter bridge(03)	• Make the circuit connections • Find the balancing length • Calculate unknown resistance • Find the radius of wire	• Find the balancing length • Calculate unknown resistance • Calculate the specific resistance
12. Mapping of magnet lines of force(03)	• Draw magnetic meridian • Placed the bar magnet in NN and NS directions • Draw magnetic lines of force • Locate the neutral points along equatorial and axial lines	• Draw magnetic lines of force • Locate the neutral points along equatorial and axial lines

CHEMISTRY LABORATORY
(common To all Branches)

Subject Title : **Chemistry Laboratory**
Subject Code : **IT -110**
Periods per week : **03**
Total periods per year : **45**

TIME SCHEDULE

S.No	Name of the Experiment	No. of Periods
1.	Familiarization of methods for Volumetric analysis	03
2.	Preparation of Std $Na_2 CO_3$ and making solutions of different dilution	03
3.	Estimation of HCl solution using Std. $Na_2 CO_3$ solution	03
4.	Estimation of NaOH using Std. HCl solution	03
5.	Estimation of H_2SO_4 using Std. NaOH solution	03
6.	Estimation of Mohr's Salt using Std. $KMnO_4$	03
7.	Determination of acidity of water sample	03
8.	Determination of alkalinity of water sample	03
9.	Determination of total hardness of water using Std. EDTA solution	03
10.	Estimation of Chlorides present in water sample	03
11.	Estimation of Dissolved Oxygen (D.O) in water sample	03
12.	Determination of pH using pH meter	03
13.	Determination of conductivity of water and adjusting ionic strength	03
14.	Determination of turbidity of water	03
15.	Estimation of total solids present in water sample	03
	Total:	**45**

Objectives:

Upon completion of the course the student shall be able to

1.0 Practice volumetric measurements (using pipettes, measuring jars, volumetric flask, burettes) and gravimetric measurements (using different types of balances), making dilutions, etc.

2.0 Practice making standard solutions with pre weighed salts and to make solutions of desired dilutions using appropriate techniques.

3.0 Conduct titrations adopting standard procedures and using Std. $Na_2 CO_3$ solution for estimation of HCl

4.0 Conduct titrations adopting standard procedures and using Std. HCl solution for estimation of NaOH

5.0 Conduct titrations adopting standard procedures and using Std. NaOH solution for

estimation of H_2SO_4

6.0   Conduct titrations adopting standard procedures and using Std. $KMnO_4$ solution for estimation of Mohr's Salt

7.0   Conduct titrations adopting standard procedures to determine the acidity of given samples of water (One ground water and one surface / tap water, and rain water if available)

8.0   Conduct titrations adopting standard procedures to determine the alkalinity of given samples of water (One ground water and one surface / tap water)

9.0   Conduct titrations adopting standard procedures to determine the total hardness of given samples of water (One ground water and one surface / tap water) using Std. EDTA solution

10.0   Conduct titrations adopting standard procedures to determine the chlorides present in the given samples of water and wastewater (One ground water and one surface / tap water)

11.0   Conduct the test using titrometric / electrometric method to determine Dissolved Oxygen (D.O) in given water samples (One sample from closed container and one from open container / tap water)

12.0   Conduct the test on given samples of water / solutions (like soft drinks, sewage, etc.) to determine their pH using standard pH meter

13.0   Conduct the test on given samples of water / solutions
        a)   To determine conductivity
        b)   To adjust the ionic strength of the sample to the desired value

14.0   Conduct the test on given samples of solutions (coloured and non coloured) to determine their turbidity in NTU

15.0   Conduct titrations adopting standard procedures to determine the total solids present in given samples of water (One ground water and one surface / tap water)

Competencies and Key competencies to be achieved by the student

Name of the Experiment (No of Periods)	Competencies	Key competencies
Familiarization of methods for Volumetric analysis (03)	--	--
Preparation of Std Na_2CO_3 and making solutions of different dilution (03)	▪ Weighing the salt to the accuracy of .01 mg ▪ Measuring the water with volumetric flask, measuring jar, volumetric pipette and graduated pipette ▪ Making appropriate dilutions	▪ Weighing the salt to the accuracy of .01 mg ▪ Measuring the water with volumetric flask, measuring jar, volumetric pipette and graduated pipette ▪ Making appropriate dilutions
Estimation of HCl solution using Std. Na_2CO_3 solution (03)	▪ Cleaning the glassware and rinsing with appropriate solutions ▪ Making standard solutions ▪ Measuring accurately the standard solutions and titrants ▪ Filling the burette with titrant ▪ Fixing the burette to the stand ▪ Effectively Controlling the flow of the titrant ▪ Identifying the end point ▪ Making accurate observations ▪ Calculating the results	▪ Making standard solutions ▪ Measuring accurately the standard solutions and titrants ▪ Effectively Controlling the flow of the titrant ▪ Identifying the end point ▪ Making accurate observations
Estimation of NaOH using Std. HCl solution (03)		
Estimation of H_2SO_4 using Std. NaOH solution (03)		
Estimation of Mohr's Salt using Std. $KMnO_4$ (03)		
Determination of acidity of water sample (03)		
Determination of alkalinity of water sample (03)		
Determination of total hardness of water using Std. EDTA solution (03)		
Estimation of Chlorides present in water sample (03)		
Estimation of Dissolved Oxygen (D.O) in water sample (By titration method) (03)		

Estimation of Dissolved Oxygen (D.O) in water sample (By electrometric method) (03)	▪ Familiarize with instrument ▪ Choose appropriate 'Mode' / 'Unit' ▪ Prepare standard solutions / buffers, etc. ▪ Standardize the instrument with appropriate standard solutions ▪ Plot the standard curve ▪ Make measurements accurately ▪ Follow Safety precautions	▪ Prepare standard solutions / buffers, etc. ▪ Standardize the instrument with appropriate standard solutions ▪ Plot the standard curve ▪ Make measurements accurately
Determination of pH using pH meter (03)		
Determination of conductivity of water and adjusting ionic strength to required level (03)		
Determination of turbidity of water (03)		
Estimation of total solids present in water sample (03)	▪ Measuring the accurate volume and weight of sample ▪ Filtering and air drying without losing any filtrate ▪ Accurately weighing the filter paper, crucible and filtrate ▪ Drying the crucible in an oven	▪ Measuring the accurate volume and weight of sample ▪ Filtering and air drying without losing any filtrate ▪ Accurately weighing the filter paper, crucible and filtrate

COMPUTER FUNDEMENTALS LABORATORY
(Common to all Branches)

Subject Title   : Computer Fundamentals Laboratory
Subject Code   : IT-111
Periods/Week   : 03
Periods/Year   : 90

Time Schedule

S. No.	Major Topics	No. of sessions each of 3 periods duration	No. of Periods
I.	**Computer hardware Basics**	02	06
II.	**Windows Operating System**	02	06
III.	**MS Word**	08	24
IV.	**MS Excel**	09	27
V.	**MS PowerPoint**	09	27
	Total	**30**	**90**

Rationale: The knowledge of Computer usage has become a must for everyone, due to wide spread computer usage and related applications in all fields. This laboratory is designed to give the students hands on practice of Windows Operating System and MS Office to enable the students to use these skills in future courses.

I. Computer Hardware Basics (Not for end examination)

1. a) To familiarize with a Computer System and its hardware connections.

    b) To Start and Shutdown a Computer correctly.
    c) To check the software details of the computer
    d) To Practice Internal and External DOS commands
2. To check the hardware present in your computer.

II. Windows's operating system (Not for end examination)

3. To Explore Windows Desktop
4. Working with Files and Folders
5. Windows Accessories: Calculator – Notepad – WordPad – MS Paint

III. Practice with MS-WORD

6. To familiarize with Ribbon layout of MS Word
       Home - Insert - Page layout – References – Review - View
7. To practice Word Processing Basics

8. To practice Formatting techniques

9. To insert a table of required number of rows and columns

10. To insert Objects, Clipart and Hyperlinks

11. To use Mail Merge feature of MS Word

12. To use Equations and symbols features

IV. Practice with MS-EXCEL

13. To familiarize with MS-EXCEL layout
14. To access and Enter data in the cells
15. To edit a spread sheet- Copy, Cut, Paste, and selecting Cells
16. To use built in functions and Formatting Data
17. To create Excel Functions, Filling Cells
18. To enter a Formula for automatic calculations
19. To practice Excel Graphs and Charts
20. To format a Worksheet in Excel, Page Setup and Print

V. Practice with MS-POWERPOINT

21. To familiarize with Ribbon layout features of PowerPoint 2007.
22. To create a simple PowerPoint Presentation
23. To set up a Master Slide in PowerPoint
24. To insert Text and Objects
25. To insert a Flow Charts
26. To insert a Table
27. To insert a Charts/Graphs
28. To insert video and audio
29. To practice Animating text and objects
30. To Review presentation

Competencies and Key Competencies to be achieved by the students

Exp No.	Name of the Experiment	Competencies	Key Competencies
1 (a).	To familiarize with Computer system and hardware connections	a. Identify the Parts of a Computer system a). CPU b) Monitor c) CD/DVD Drive d) Power Switch e) Start Button f) Reset Button b. Identify and connect various peripherals c. Identify and connect the cables used with computer system d. Identify various ports on CPU and connect Keyboard & Mouse	Connect cables to external hardware and operate the computer
1 (b).	To Start and Shut down Computer correctly	a. Log in using the password b. Start and shut down the computer c. Use Mouse and Keyboard	a. Login and logout as per the standard procedure b. Operate mouse & Keyboard
1 (c).	To Explore Windows Desktop	a. Familiarize with Start Menu, Taskbar, Icons and Shortcuts b. Access application programs using Start menu, Task manager c. Use Help support	a. Access application programs using Start menu b. Use taskbar and Task manager
1(d).	To Practice Internal and External DOS commands	a. Practice Internal commands b. Practice External commands	Familiarize with MS-DOS Commands
2.	To check the software details of the computer	c. Find the details of Operating System being used d. Find the details of Service Pack installed	Access the properties of computer and find the details
3.	To check the hardware present in your computer	a. Find the CPU name and clock speed b. Find the details of RAM and Hard disk present c. Access Device manager using Control Panel and check the status of devices like mouse and key board d. Use My Computer to check the details of Hard Disk Drives and partitions e. Use the Taskbar	a. Access device manager and find the details b. Type /Navigate the correct path and Select icon related to the details required
4.	Working with Files and Folders	a. Create folders and organizing files in different folders b. Use copy / paste or move commands to organize files and folders	a. Create files and folders rename , arrange and search for the required folder/file

Exp No.	Name of the Experiment	Competencies	Key Competencies
	Working with Files and Folders Continued....	c. Arrange icons – name wise, size, type, Modified d. Search a file or folder and find its path e. Create shortcut for files and folders (in other folders) on Desktop f. Familiarize with the use of My Documents g. Familiarize with the use of Recycle Bin	b. Restore deleted files from Recycle bin
5.	To use Windows Accessories: Calculator – Notepad – WordPad – MS Paint	a. Familiarize with the use of Calculator b. Access Calculator using Run command c. Create Text Files using Notepad and WordPad and observe the difference in file size d. Use MS paint and create .jpeg, .bmp files using MS Paint	a. Use windows accessories and select correct text editor based on the situation. b. Use MS Paint to create /Edit pictures and save in the required format.
6.	To familiarize with Ribbon layout of MS Word. – Home – Insert- Page Layout- References- Review-View	a. Create/Open a document b. Use Save and Save as features c. Work on two documents simultaneously d. Choose correct Paper size and Printing options	a. Create a Document and name appropriately and save b. Set paper size and print options
7.	To practice Word Processing Basics	a. Typing text b. Keyboard usage c. Use mouse (Left click / Right click / Scroll) d. Use Keyboard shortcuts e. Use Find and Replace features in MS- word f. Use Undo and Redo Features g. Use spell check to correct Spellings and Grammar	a. Use keyboard and mouse to enter/edit text in the document. b. Use shortcuts c. Use spell check/ Grammar features for auto corrections.
8.	To practice Formatting techniques	a. Formatting Text b. Formatting Paragraphs c. Setting Tabs d. Formatting Pages e. The Styles of Word f. Insert bullets and numbers g. Themes and Templates h. Insert page numbers, header and footer	a. Format Text and paragraphs and use various text styles. b. Use bullets and numbers to create lists c. Use Templates /Themes d. Insert page numbers date, headers and footers

Exp No.	Name of the Experiment	Competencies	Key Competencies
9.	To insert a table of required number of rows and columns	a. Edit the table by adding the fields – Deleting rows and columns –inserting sub table – marking borders. Merging and splitting of cells in a Table b. Changing the background colour of the table c. Use table design tools d. Use auto fit – fixed row/ column height/length – Even distribution of rows / columns features e. Convert Text to table and Table to Text f. Use Sort feature of the Table to arrange data in ascending/descending order	a. Insert table in the word document and edit b. Use sort option for arranging data.
10.	To Insert objects, clipart and Hyperlinks	a. Create a 2-page document. &Insert hyperlinks and Bookmarks. b. Create an organization chart c. Practice examples like preparing an Examination schedule notice with a hyperlink to Exam schedule table.	a. Insert hyperlinks &Bookmarks b. Create organization charts/flow charts
11.	To Use Mail merge feature of MS Word	a. Use mail merge to prepare individually addressed letters b. Use mail merge to print envelopes.	Use Mail merge feature
12.	To use Equations and symbols features.	a. Explore various symbols available in MS Word b. Insert a symbol in the text c. Insert mathematical equations in the document	Enter Mathematical symbols and Equations in the word document
13.	To Practice with MS-EXCEL	a. Open /create an MS Excel spreadsheet and familiarize with MS Excel 2007 layout like MS office Button- b. Use Quick Access Toolbar- Title Bar- Ribbon-Worksheets-Formula Bar-Status Bar	a. Familiarize with excel layout and use b. Use various features available in toolbar
14.	To access and Enter data in the cells	a. Move around a Worksheet-Quick access -Select Cells b. Enter Data-Edit a Cell-Wrap Text-Delete a Cell Entry-Save a File-Close Excel	a. Access and select the required cells by various addressing methods b. Enter data and edit

Exp No.	Name of the Experiment	Competencies	Key Competencies
15.	To edit spread sheet Copy, Cut, Paste, and selecting cells	a. Insert and Delete Columns and Rows-Create Borders-Merge and Center b. Add Background Color-Change the Font, Font Size, and Font Color c. Format text with Bold, Italicize, and Underline-Work with Long Text-Change a Column's Width	Format the excel sheet
16.	To use built in functions and Formatting Data	a. Sort and filter data in a worksheet b. Perform Mathematical Calculations verify -AutoSum c. Perform Automatic Calculations-Align Cell Entries	Use built in functions in Excel
17.	To enter a Formula for automatic calculations	a. Enter formula b. Use Cell References in Formulae c. Use Automatic updating function of Excel Formulae d. Use Mathematical Operators in Formulae e. Use Excel Error Message and Help	Enter formula for automatic calculations
18.	To Create Excel Functions, Filling Cells	a. Use Reference Operators b. Work with sum, Sum if , Count and Count If Functions c. Fill Cells Automatically	a. Create Excel sheets involving cross references and equations b. Use the advanced functions for conditional calculations
19.	To Practice Excel Graphs and Charts	a. Produce an Excel Pie Chart b. Produce an Excel Column Chart c. Practice creating any Chart	a. Use data in Excel sheet to Create technical charts and graphs Produce Excel Line Graph b. Produce a Pictograph in Excel
20.	To format a Worksheet in Excel, page setup and print	a. Shade alternate rows of data b. Add currency and percent symbols c. Change height of a row and width of a column d. Change data alignment e. Insert Headers and Footers f. Set Print Options and Print	a. Format Excel sheet b. Insert headers &footers and print
21.	To familiarize with Ribbon layout &features of PowerPoint 2007.	Use various options in Home, insert, design, animation , slideshow, Review &View in the PowerPoint	Access required options in the tool bar

Exp No.	Name of the Experiment	Competencies	Key Competencies
22.	To create a simple PowerPoint Presentation	a. Insert a New Slide into PowerPoint b. Change the Title of a PowerPoint Slide c. PowerPoint Bullets d. Add an Image to a PowerPoint Slide e. Add a Textbox to a PowerPoint slide	a. Create simple PowerPoint presentation with photographs/ClipArt and text boxes b. Use bullets option
23.	To Set up a Master Slide in PowerPoint and add notes	a. Create a PowerPoint Design Template b. Modify themes c. Switch between Slide master view and Normal view d. Format a Design Template Master Slide e. Add a Title Slide to a Design Template f. The Slide Show Footer in PowerPoint f. Add Notes to a PowerPoint Presentation	a. Setup Masterslide and format b. Add notes
24.	To Insert Text and Objects	a. Insert Text and objects b. Set Indents and line spacing c. Insert pictures/ clipart d. Format pictures e. Insert shapes and WordArt f. Use 3d features g. Arrange objects	Inset Text and Objects Use 3d features
25.	To insert a Flow Chart / Organizational Charts	a. Create a Flow Chart in PowerPoint b. Group and Ungroup Shapes c. Use smart art	Create organizational charts and flow charts using smart art
26.	To insert a Table	a. PowerPoint Tables b. Format the Table Data c. Change Table Background d. Format Series Legend	Insert tables and format
27.	To insert a Charts/Graphs	a. Create 3D Bar Graphs in PowerPoint b. Work with the PowerPoint Datasheet c. Format a PowerPoint Chart Axis d. Format the Bars of a Chart e. Create PowerPoint Pie Charts f. Use Pie Chart Segments g. Create 2D Bar Charts in PowerPoint h. Format the 2D Chart e. Format a Chart Background	Create charts and Bar graphs, Pie Charts and format.

Exp No.	Name of the Experiment	Competencies	Key Competencies
28.	To Insert audio &video, Hyperlinks in a slide Add narration to the slide	a. Insert sounds in the slide and hide the audio symbol b. Adjust the volume in the settings c. Insert video file in the format supported by PowerPoint in a slide d. Use automatic and on click options e. Add narration to the slide f. Insert Hyperlinks	a. Insert Sounds and Video in appropriate format. b. Add narration to the slide c. Use hyperlinks to switch to different slides and files
29.	To Practice Animation effects	a. Apply transitions to slides b. To explore and practice special animation effects like *Entrance, Emphasis, Motion Paths &Exit*	Add animation effects
30.	Reviewing presentation	a. Checking spelling and grammar b. Previewing presentation c. Set up slide show d. Set up resolution e. Exercise with Rehearse Timings feature in PowerPoint f. Use PowerPoint Pen Tool during slide show g. Saving h. Printing presentation (a) Slides (b) Handout	a. Use Spell check and Grammar feature b. Setup slide show c. Add timing to the slides d. Setup automatic slide show

III SEMESTER

DIPLOMA IN INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2016 (III Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practical's		Duration (hrs)	Session al Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
IT-301	Engineering Mathematics –II	5	-	75	3	20	80	100
IT-302	Digital Electronics& Computer Architecture	6	-	90	3	20	80	100
IT-303	Multimedia Basics	5	-	75	3	20	80	100
IT-304	Data Structures through C	5	-	75	3	20	80	100
IT-305	DBMS	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								
IT-306	Digital Electronics Lab		3	45	3	40	60	100
IT-307	Multimedia lab	-	3	45	3	40	60	100
IT-308	Data Structures Through C Lab	-	4	60	3	40	60	100
IT-309	DBMS Lab	-	6	90	3	40	60	100
	Total	26	16	630	-	260	640	900

* IT-301, IT-302, IT-304,IT-305 common with CM-301, CM-302 ,CM-304,CM-305

Subject Title	:	Engineering Mathematics-II
Subject Code	:	IT-301
Periods per week	:	05
Periods per Semester	:	75

Blue print

OBJECTIVES

S. No	Major Topic	No of Periods	Weightage of Marks	Short Type			Essay Type		
	Unit - I			R	U	App	R	U	App
1	Indefinite Integration	15	21	1	1	0	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
	Unit - II								
2	Definite Integration and its applications	35	60	1	1	3	1	1	$2\frac{1}{2}$
	Unit - III								
3	Differential Equations	25	29	2	1	0	1	1	0
	Total	75	110	4	3	3	$2\frac{1}{2}$	$2\frac{1}{2}$	30
			Marks:	12	9	9	25	25	30

R:	Remembering type	37 marks
U:	Understanding type	34 marks
App:	Application type	39 marks

Upon completion of the subject the student shall be able to

Unit-I
1.0   Indefinite Integration
1.1   Explain the concept of Indefinite integral as an anti-derivative.
1.2   State the indefinite integral of standard functions and properties of Integrals $\int (u + v)\ dx$ and $\int ku\ dx$ where k is constant and u, v are functions of $x.$
1.3   Solve integration problems involving standard functions using the above rules.
1.4   Evaluate integrals involving simple functions of the following type by the method of substitution.

i) $\int f(ax + b)\, dx$ where $f(x)\, dx$ is in standard form.

ii) $\int [f(x)]^n\, f'(x)\, dx$

iii) $\int f'(x)/[f(x)]\, dx$

iv) $\int f\{g(x)\}\, g'(x)\, dx$

1.5 Find the Integrals of *tan x, cot x, sec x* and *cosec x* using the above.

1.6 Evaluate the integrals of the form $\int Sin^m\theta\ Cos^n\theta.\, d\theta$ where m and n are positive integers.

1.7 Evaluate integrals of powers of *tan x* and *sec x.*

1.8 Evaluate the Standard Integrals of the functions of the type

$$i)\ \frac{1}{a^2 + x^2}\ ,\ \frac{1}{a^2 - x^2}\ ,\ \frac{1}{x^2 - a^2}$$

$$ii)\ \frac{1}{\sqrt{a^2 + x^2}}\ ,\ \frac{1}{\sqrt{a^2 - x^2}}\ ,\ \frac{1}{\sqrt{x^2 - a^2}}$$

$$iii)\ \sqrt{x^2 - a^2}\ ,\ \sqrt{x^2 + a^2}\ ,\ \sqrt{a^2 - x^2}$$

1.9 Evaluate the integrals of the type

$$\int \frac{1}{a \pm b\, Sin\theta}\, d\theta,\ \int \frac{1}{a \pm b\cos\theta}\, d\theta\ \text{and}\ \int \frac{1}{a\cos\theta \pm b\sin\theta \pm c}\, d\theta\ .$$

1.10 Evaluate integrals using decomposition method.

1.11 Evaluate integrals using integration by parts with examples.

1.12 State the Bernoulli's rule for evaluating the integrals of the form $\int u.v\, dx$.

1.13 Evaluate the integrals of the form $\int e^x [f(x) + f'(x)]\, dx.$

Unit-II

(a) Understand definite integral and its properties

2.1 State the fundamental theorem of integral calculus

2.2 Explain the concept of definite integral.

2.3 Calculate the definite integral over an interval.

2.4 State various properties of definite integrals.

2.5 Evaluate simple problems on definite integrals using the above properties.

(b) Real life applications of definite integrals

2.6 Explain definite integral as a limit of sum by considering an area.

2.7 Find the areas under plane curves and area enclosed between two curves using integration.

2.8 Obtain the volumes of solids of revolution.

2.9 Obtain the mean value and root mean square value of the functions in any given interval.

2.10 Explain the Trapezoidal rule, Simpson's 1/3 rules for approximation of integrals and provide some examples.

(c) Certain special integrals: Laplace Transforms

2.11 Write the definition of Laplace Transform and explain sufficient conditions for its existence.

2.12   Provide formulae for Laplace transforms of standard functions.

2.13   State Linear property, First shifting property, Change of Scale property for Laplace transforms. Solve simple problems using these properties.

2.14   Write formulae for Laplace transform of $t^n f(t)$, $\dfrac{f(t)}{t}$, $f^{(n)}(t)$, $\displaystyle\int_0^t f(u)\,du$ in terms of

Laplace transform of $f(t)$. Provide simple examples on these functions.

2.15   Define unit step function and write the Laplace Transform of unit step function.

State second shifting property.

2.16   Define inverse Laplace Transform and write inverse Laplace Transform of standard functions. Solve simple problems.

2.17   Write first shifting property of inverse Laplace Transform with examples

2.18   Define convolution of two functions and state convolution theorem with few examples for understanding only.

(d)   Understand the Fourier series expansion of functions

2.19   Define Fourier series of a function on the interval $(c, c + 2l)$ and state sufficient conditions for its existence. Write the Euler's formulae for determining the Fourier coefficients.

2.20   Find Fourier series of simple functions in the range $(0, 2l), (0, 2\pi), (-l, l)$ and $(-\pi, \pi)$.

2.21   Find Fourier coefficients for even and odd functions in the interval $(-l, l)$ and $(-\pi, \pi)$ in simple examples.

2.22   Define half range Fourier sine and cosine series of a function over the interval $(0, l)$ with examples.

3.0   Introduction to Differential Equations
3.1   Define a Differential equation, its order, degree
3.2   Form a differential equation by eliminating arbitrary constants.
3.3   Solve the first order first degree differential equations by the following methods:
    i.   Variables Separable.
    ii.   Homogeneous Equations.
    iii.   Exact Differential Equations
    iv.   Linear differential equation of the form dy/dx + Py = Q,
        where P and Q are functions of x or constants.
    iv.   Bernoulli's Equation (Reducible to linear form.)

3.4   Solve Differential equations of the type $(aD^2 + bD + c)y = 0$ when the roots of the auxiliary equation are real and different, real and repeated, Complex conjugates.

3.5   Solve the higher order homogeneous differential equations with constant coefficients.

3.6   Explain the concept of complementary function, particular Integral and general solution of a differential equation.

3.7   Solve n^{th} order differential equation of the type $f(D)\,y = X$ where $f(D)$ is a polynomial of nth order and X is a function of the form $k,\ e^{ax}$, Sinax, Cosax, x^n.

3.8   Solve simple problems leading to engineering applications

COURSE CONTENT

Unit-I
Indefinite Integration:

1.   Integration regarded as anti-derivative – Indefinite integral of standard functions. Properties of indefinite integral. Integration by substitution or change of variable. Integrals of the form
$\sin^m\theta \cdot \cos^n\theta$. where m and n are positive integers. Integrals of tan x, cot x, sec x, cosec x and powers of tan x, sec x by substitution.

Evaluation of integrals which are reducible to the following forms :

$$i)\ \frac{1}{a^2 + x^2},\ \frac{1}{a^2 - x^2},\ \frac{1}{x^2 - a^2}$$

$$ii)\ \frac{1}{\sqrt{a^2 + x^2}},\ \frac{1}{\sqrt{a^2 - x^2}},\ \frac{1}{\sqrt{x^2 - a^2}}$$

$$iii)\ \sqrt{x^2 - a^2},\ \sqrt{x^2 + a^2},\ \sqrt{a^2 - x^2}$$

Integration by decomposition of the integrand into simple rational, algebraic functions. Integration by parts, Bernoulli's rule.

Unit-II
Definite Integral and its applications:

2.   Definite integral-fundamental theorem of integral calculus, properties of definite integrals, evaluation of simple definite integrals. Definite integral as the limit of a sum. Area under plane curves – Area enclosed between two curves. Volumes of solids of revolution. Mean and RMS values of a function on a given interval. Trapezoidal rule, Simpson's 1/3 rule to evaluate an approximate value of a define integral.

.   Definition, sufficient conditions for existence of Laplace Transform (LT), LT of elementary functions, linearity property, scale change property, first shifting property, multiplication by t^n, division by t, LT of derivatives and integrals, unit step function, LT of unit step function, second shifting theorem, inverse Laplace transforms- shifting

theorems and change of scale property, multiplication by s^n and division by s – examples of inverse LT using partial fractions – convolution theorem (no proof).

Representation of a function in Fourier series over the interval $(c, c + 2l)$, Give sufficient conditions for existence of Fourier series. Euler's formulae for Fourier coefficients, Finding Fourier coefficients for simple functions, elementary even and odd functions. Define half range Fourier series.

Unit -III
Differential Equations:

Definition of a differential equation-order and degree of a differential equation- formation of differential equations-solution of differential equation of first order, first degree: variable-separable, homogeneous, exact, linear differential equation, Bernoulli's equation.

Homogenous linear differential equations with constant coefficients of order two and higher with emphasis on second order.

Non-homogenous linear differential equations with constant coefficients of the form
$f(D)y = X$, where X is in the form k, e^{ax}, sin ax, cos ax, x^n, (n= 1,2) – complimentary function, particular integral and general solution.

Reference Books:
1. Integral Calculus Vol.I, by M.Pillai and Shanti Narayan
2. Thomas' Calculus, Pearson Addison –Wesley Publishers
3. A Text book of Engg. Mathematics by B.S.Grawel
4. A Text book of Engg. Mathematics by B.V.Ramana- T.Mc Graw Hill Publishers

DIGITAL ELECTRONICS & COMPUTER ARCHITECTURE

Subject Title : Digital Electronics & Computer Architecture
Subject Code : IT– 302
Periods per Week : 06
Periods per Semester : 90

TIME SCHEDULE

SNO	MAJOR TOPICS	NO. OF PERIODS	WEIGHTAGE OF MARKS	SHORT ANSWER QUESTIONS	ESSAY QUESTIONS
1	Logic Gates & Boolean Algebra	15	16	2	1
2	Logic Families and Flip-Flops	10	13	1	1
3	Counters and registers	15	18	1	1 ½
4	Combinational circuits	5	8	1	½
5	CPU Organization	10	13	1	1
6	Information representation , Arithmetic Operations	20	21	2	1 ½
7	Memory Organization	07	8	1	½
8	I/O Organization	08	13	1	1
	Total	**90**	**110**	**10**	**08**

OBJECTIVES

On completion of the study of the subject the student should be able to comprehend the following

1.0 Comprehend Boolean algebra and working of different logic gates.

1.1   Define AND, OR, NOT operators with truth tables.

1.2   Explain the working of EX-OR and EX-NOR gates with truth tables.

1.3   Explain the working of NAND and NOR gates using truth tables.

1.4   Develop AND, OR, NOT, EX-OR gates using NAND gates only, NOR gates only.

1.5   State the different postulates in Boolean algebra.

1.6   State De-Morgan's theorems.

1.7   Apply De-Morgan's theorems and other postulates of Boolean algebra to simplify the given Boolean expression.

1.8   Write Boolean expression for given truth table.

1.9   Use K – map to simplify Boolean expression (up to 4 variables).

1.10   Comprehend the working of arithmetic circuit.

1.11   State the functions of Half Adder.

1.12   Draw Half-Adder circuit using an exclusive OR and an AND gate.

1.13   Show that two Half-Adder and an OR gate constitute a Full-Adder.

1.14   Realize a Half–Adder using only NAND gates or only NOR gates.

1.15   Draw a 4-bit parallel adder using full adders.

1.16   Explain the working of the above circuit.

1.17   Draw a 4-bit parallel adder/ 2's complement subtractor circuit.

1.18   Explain the working of the above circuit.

1.19   Explain the working of a serial adder with a block diagram.

1.20   Compare the advantage and disadvantages of a serial adder with a
        parallel adder.

1.21   Explain the operation of a digital comparator circuit for two 4 bit words.

2.0   Logic Families and Flip Flops
2.1   Know the details of different logic families**.**

2.2   Define positive and negative logic levels.

2.3   State the basic principle of operation of a Flip-flop.

2.4   Explain the working of a NAND/NOR gate latch.

2.5   Explain with block diagram, waveforms and truth tables the working of
        RS, RST, T, D and JK Flip-flop.

2.6   Discus the concept of edge and level triggering flip-flops.

2.7   Distinguish between synchronous and asynchronous inputs of a
        flip- flop and state their functions.

2.8   State the need for a Master-Slave flip-flop.

2.9   Explain the working of a Master-Slave flip-flop using suitable diagram
        and truth table.

2.10   State the principle of operation of monostable multi vibrator and
        Schmitt   trigger circuit.

3.0   Comprehend the function of counters and Registers and their working.
3.1   Distinguish between asynchronous and synchronous counters.

3.2   Draw and explain module-8 ripple counter and decade counter.

3.3   Explain the counting sequence with waveforms and truth tables in the
        above circuit.

3.4 Explain the draw backs of ripple counters.

3.5 Draw and explain a 4-bit synchronous counter operation

3.6 Explain the operation of a up/down counter, using flip flops.

3.7 Discuss the need for a programmable counter using flip flops.

3.8 Explain the operation of a programmable counter using flip flops.

3.9 Draw and explain the operation of a 4-bit ring counter.

3.10 State the applications of counter.

3.11 Explain the transfer of data between register.

3.12 Explain the working of serial in – serial out and serial in – parallel out register.

3.13 Explain the working of shift left, shift right registers, universal shift register. (Example 74194 or equivalent)

3.14 State the use of shift register as memory.

4.0 Understand the combinational circuits

4.1 Illustrate the applications of a multiplexer with a circuit diagram.

4.2 Describe the operation of a 4 to 10 line decoder.

4.3 Illustrate the application of a demultiplexer with a circuit diagram.

4.4 Mention some applications of multiplexers and demultiplexers.

5.0 Understand the Processor Organization

5.1 Draw the functional block diagram of Digital computer and explain the function of each unit.

5.2 Draw the block diagram of simple accumulator based CPU.

5.3 Explain the function of each unit.

5.4 Define the terms micro operation, macro operation, instruction cycle, fetch cycle and execution cycle.

5.5 Define stored program concept.

5.6 Describe the sequential execution of a program stored in memory by the CPU.

6.0 Comprehend the process of Information representation and Arithmetic Operation

6.1 Explain the basic types of information representation in a computer.

6.2 Define floating point representation and fixed point representation of numbers.

6.3 Illustrate the same with example.

6.4   Distinguish between above two representations.

6.5   Define Operand, Opcode and address.

6.6   Explain zero address, one address, two address and three address instructions with simple examples.

6.7   Discuss different addressing modes.

6.8   Explain the fixed point addition and subtraction, multiplication and division operations with flowcharts.

6.9   Explain floating point addition, subtraction, multiplication and division   operations with flowcharts.

7.0   Appreciate organization of Computer Memory system.

7.1   Distinguish between main and auxiliary memory.

7.2   Explain the need for memory hierarchy in a computer.

7.3   State the significance of various memory devices characteristics:
       access time, access rate, alterability , permanence of storage, cycle time.

7.4   Explain Associative Memory

7.5   Know the principle of virtual memory organization in a computer system

7.6   Explain virtual address and physical address organization.

7.7   Explain the principle and advantage of cache memory organization.

7.8   Explain the principle of memory interleaving in a computer.

8.0   Know the input and output organization of a computer.

8.1   List the various peripheral devices that can be connected to a computer.

8.2   Explain the need for an interface.

8.3   List out three modes of date transfer.

8.4   Explain synchronous and asynchronous data transfer.

8.5   Explain hand shaking (scheme) procedure of data transfer.

8.6   Explain programmed I/O method of data transfer.

5.7   Explain interrupted initiated I/O.

8.8   Explain DMA controlled transfer.

8.9   Explain priority interrupt, polling, and daisy chaining priority.

8.10   Explain about a bus system.

8.11   Name a few bus systems.

COURSE CONTENTS

1. **Logical Gates and Boolean algebra :** AND, OR, NAND, NOT, NOR & EX-OR gates. Logical definitions – Symbols – truth tables. Boolean theorems, Boolean simplifications of Boolean expressions, Using De-Morgan's theorems, Formation and implementation of Logic expressions, Karnaugh's mapping, Applications involving developing of combinational logic circuits. Half-Adder, Full-adder, Subtractor series – Parallel Binary adder – Parallel adder/subtractor circuits.

2. **FLIP FLOP: Different logic families,** Basic principles of Flip Flop operation (with help of wave form & truth tables) of RS,T,D,JK and Master Slave JK flip flop concept of Edge Triggering and Level Triggering , Synchronous and Asynchronous device.

3. **Counters:** Basic Asynchronous, Synchronous Binary and Decade counter and the Ripple counter, their use Decade counter, Up and Down counters, Ring counter.

4. **Registers :** Shift registers, Serial, Parallel register, Serial-in Parallel out, Parallel-in– serial out devices, Universal shift registers, Applications, Decoders, - Multiplexers, Demultiplexers and Encoders

5   **CPU Organisation**
    Functional block diagram of a simple accumulator based CPU – Micro operation – Macro operation basic instruction – Stored Program concept.

6   **Information Representation and arithmetic Operations**
    Fixed point and floating point representation of numbers – Operand, opcode and address – Instruction formats and instruction types – Addressing modes.
    Fixed point and floating point addition, subtraction, Multiplication and Division.

7   **Memory Organization**
    Memory hierarchy in a computer – Various memory devices – Characteristics of various memory devices – Associative memory – virtual memory organization – Cache memory – Memory interleaving.

8   **Input and Output Organization**
    Interface – methods of data transfer – Programmed I/O, DMA and priority interrupt, computer with I/O processor – Bus organization.

REFERENCE BOOKS

1. Digital principles and applications   --   Malvino and leach

2. Digital Electronics   --   Bignell - Thomson

3. Modern Digital Electronics   --   R.P. Jain

4. Computer System Architecture   --   Morris Mano.

5. Structured Computer Organization   --   Andrews Tennenbaum.

6. Computer Organization   --   Govindarajulu (TMH).

7. Computer Organization & Architecture   --   William Stallings

<u>**MULTIMEDIA BASICS**</u>

Subject Title : **Multimedia Basics**
Subject Code : **IT – 303**
Periods per Week : **05**
Periods per Semester : **75**

Sl.No	Major Topics	Periods	Weightage of Marks	Short Questions	Essay Questions
TIME SCHEDULE					
1	Introduction To Multimedia	15	16	2	1
2	Working With Photoshop	25	39	3	3
3	Working With Flash	20	29	3	2
4	Web Site Development	15	26	2	2
	TOTAL	75	110	10	8

1.0 Introduction to Multimedia

    1.1   What is Multimedia?

    1.2   Components of Multimedia.

    1.3   History of Multimedia?

    1.4   Hypermedia and Multimedia.

    1.5   Overview of Multimedia software tools.

    1.6   Multimedia editing and authoring tools.

    1.7   Graphics and image data types.

        1.7.1 1 bit images

        1.7.2 8 bit images

        1.7.3 Image data types

        1.7.4 24 bit color images

        1.7.5 8 bit color images

    1.8   Popular file formats

        1.8.1 GIF

        1.8.2 JPEG

        1.8.3 PNG

        1.8.4 TIFF

4.3   Formatting and linking web pages

4.4   Adding color, graphs and animation to web pages

1.0   Introduction to Multimedia
What is Multimedia – Components of Multimedia – History of Multimedia – Hypermedia and Multimedia – Overview of Multimedia software tools. Multimedia editing and authoring tool Graphics and image data types, 1 bit images, 8 bit images, image data types, 24 bit color images, 8 bit color images, Popular file formats, GIF, JPEG, PNG, TIFF, EXIF, Graphic animation files, PS and PDF, WMF, BMP, Fundamental concepts in Video, Type of video signals, Component video, Composite video, S video, Analog video, NTSC, PAL, SECAM, Digital Audio, Chroma, CCIR, High definition TV, Basics of Digital Audio, What is Sound?, Digitization, Nyquist Theorem, Signal to noise ratio, SQNR, Linear and non linear, Audio filtering.

2.0   WORKING WITH PHOTOSHOP
Basics, Tool box, Working with selection tools, Rectangular and elliptical Marquees, Lasso, The polygonal Lasso Tool, The magnetic Lasso, Magic wand, Selection menu, Feather, Modifying selections, Selecting large areas, Cutting and pasting, Transforming, Resizing, Rotating, Color modes and color models, Adjusting colors, Paint brushes and art tools, Digital painting, Moving paint, Layers, Masks, Paths, Different Filters, Photo repair and enhancement

3.0   WORKING WITH FLASH
Understanding the flash, Learning the flash, Learning Flash panels, Drawing objects, Creating animations, Using guides and masks, Creating symbols, Adding sounds to movies, Publishing flash movies.

4.0   Web site Development
Understand HTML, Creating a web page, Formatting and linking web pages, Adding color, graphs and animation to web pages.

REFERENCE BOOKS

1.   Fundamentals of Multimedia, Ze – Nian li and Mark S Drew, Pearson Education,2004

2.   Multimedia Basics, Morse, Thomson Course Technology.

3.   Macromedia Flash MX, a befinner's guide, Brain Underdahi, Dreamtech press,2002.

4.   Photoshop CS, Sams Teach yourself, Carla Rose, pearson Education, Six edition, 2004.

DATA STRUCTURES USING C

Subject Title	:	Data Structures using C
Subject Code	:	IT – 304
Periods per Week	:	05
Periods per Semester	:	75

S.No	Major Topics	No. of Periods	Weightage of Marks	Short answer questions	Essay questions
1	Introduction to Data structures	6	6	2	0
2	Linear Data structures	30	52	4	4
3	Non Linear Data structures	16	26	2	2
4	Sorting	18	18	1	1½
5	Searching	5	8	1	½
	Total	75	110	10	8

OBJECTIVES

On completion of the study of the subject the student shall be able to

1.0 Understand an Overview of Data Structures

1.1. Define data structure and classify them
1.2. Explain linear data structures
1.3. Describe nonlinear data structures
1.4. Explain data types and abstract data types
1.5. State algorithm analysis for time requirements

2. Understand Linear Data structures
2.1. Comprehend Linked list
2.1.1. List the advantages & disadvantages of linked lists over arrays
2.1.2. State the purpose of dummy header
2.1.3. Explain the creation of a singly linked list
2.1.4. Know how to represent a node of singly linked list using 'C' structure
2.1.5. Write the program for creation of a singly linked list.
2.1.6. Perform insertion and deletion operation on a singly linked list
2.1.7. Know how to search and replace an element in a linked list
2.1.8. Knowthe structure of a singly circular linked list
2.1.9. List the advantages of a singly circular linked listover a singly linked list
2.1.10. Know how to represent a node of singly circular linked list using 'C' structure
2.1.11. Know the changes require in a singly linked list program to make it the singly circular list.
2.1.12. Knowthe structure of a doubly linked list
2.1.13. Know how to create a doubly linked list

2.1.14. Know how to represent a node of doubly linked list using 'C' structure
2.1.15. Know how to Insert and delete elements in a doubly linked list
2.1.16. List the advantages of a doubly linked listover a singly linked list
2.1.17. Know the Doubly Circular Linked Lists

2.2.   **Understand Queues and Stacks**

2.2.1   Define stack
2.2.2   Explain the two operations of a stack
2.2.3   Explain array implementation of a stack
2.2.4   List the five applications of stacks
2.2.5   Convert infix to postfix expression
2.2.6   Evaluate postfix expression
2.2.7   Define queue
2.2.8   Explain the operations on queues
2.2.9   Discuss application of queues
2.2.10 Explain array implementation of a queue
2.2.11 Know about circular queues
2.2.12 Know about priority queues

3.0 Know the Tree structures
3.1   Define a tree
3.2   Explain the terminology related to tree
3.3   Define a binary tree
3.4   Explain the linear representation and linked list representation of a Binary tree
3.5   Write a program to create and display a Binary Tree
3.6   Perform traversal operation on Binary Trees
3.7   Construct a binary tree using inorder and preorder traversals
3.8   Construct a binary tree using inorder and postorder traversals
3.9   Know the importance of Binary Trees over General Trees
3.10   Convert of general trees to binary trees
3.11   Perform operations on a binary tree
3.12   List the Applications of trees

4.0   Understand various Sorting techniques

4.1   Define sorting
4.2   State the need of sorting
4.3   List the four methods of sorting
4.4   Explain the method of bubble sort
4.5   Write the algorithm for bubble sort and derive its complexity
4.6   Discuss the program for bubble sort
4.7   Explain the method of selection sort
4.8   Write the algorithm for selection sort and define its complexity
4.9   Discuss the program for selection sort
4.10   Explain the method of insertion sort
4.11   Write the algorithm for insertion sort and define its complexity
4.12   Discuss the program for insertion sort
4.13   Explain the method of quick sort
4.14   Explain the method of merging two sorted lists
4.15   Discuss the program to implement merge sort on two sorted lists

5.0   Understand different Searching Techniques
    5.1 Define searching
    5.2 State the need of searching
    5.3 List two types of searching
    5.4 Explain the method of Linear Search
    5.5 Write the algorithm for Linear Search and its complexity
    5.6 Discuss the program for Linear Search
    5.7 Explain the method of Binary Search
    5.8 Write the algorithm for Binary Search and its complexity
    5.9 Discuss the program for Binary Search
    5.10   Differences between Linear Search and Binary Search

COURSE CONTENTS

1.   Introduction to data structures

Data structures – Linear &non linear, data types and abstract data types, algorithm analysis for time and space requirements.

2.   Linear data structures
Linked Lists – Types **-** Singly linked lists – Create, insert, delete, sort, search and replace an element in a linked list –, Create singly circular linked list.Know about Doubly linked list –-   know doubly linked circular list.

Queues and stacks

Implementation of stacks, application of stacks, converting infix to postfix expression and evaluation – Applications & Implementation of queues, - know about Circular queues, and Priority queue.

3.   Non Linear Data Structures
Trees

Trees –Binary trees – Linear representation – Linked list representation, tree traversals, Tree Conversion & Applications

4.   Sorting

 Introduction to different sorting techniques – selection, insertion, bubble, quick & merge.

5   Searching
 Introduction to different searching techniques – sequential and binary.

REFERENCE BOOKS
1.   Data Structures: A Pseudocode Approach with C   -Gilberg / Forouzan
2.   Data Structures using 'C'   - Tanenbaumlangsam and
                                                               Augonstein (PHI).
3. Data structures through C   - YashwanthKanetkar
4. An Introduction to data structures with applications   - Tremblay & Sorenson

DBMS

Subject Title	: DBMS
Subject Code	: IT - 305
Periods per week	: 05
Periods per Semester	: 75

TIME SCHEDULE

Unit No	Major Topic	No of Periods	Weightage of marks	Short Answer Questions	Essay Questions
1	Concepts of DBMS & RDBMS	20	29	3	2
2.	Concepts of SQL	16	24	3	1½
3.	Elements of PL/SQL	18	23	1	2
4.	Concepts of NoSQL	12	18	1	1½
5.	Basics of MongoDB	09	16	2	1
	Total	**75**	**110**	**10**	**08**

OBJECTIVES

On completion of the study of the subject the student shall be able to

1.0   Understand the concepts of DBMS & RDBMS
    1.1   Define Database System
    1.2   List the advantages of Database System
    1.3   Explain Database Abstraction
    1.4   Explain Data Models
    1.5   Define Instances and Schemas
    1.6   Explain Data Independence.
    1.7   Explain Data Definition Language(DDL)
    1.8   Explain Data Manipulation Languages(DML)
    1.9   Explain Database Manager
    1.10   Explain Database Administrator and Users
    1.11   Describe the overall System Structure
    1.12   Explain Entity and Entity Sets
    1.13   Explain Relationship and Relationship Sets
    1.14   Define the terms-Super Key , Candidate Key and Primary Key
    1.15   Explain Mapping Constraints
    1.16   Reduce the ER-diagrams to tables
    1.17   Explain Generalization, Specialization and Aggregation
    1.18   Explain Functional Dependencies
    1.19   Describe Normalizations– 1 NF, 2 NF, 3 NF
    1.20   Explain E.F.CODD's rules for RDBMS
    1.21   List the schema objects
    1.22   Explain the procedure of creating, altering and dropping tables
    1.23   Explain management of integrity constraints like Primary key, Foreign key,
         Unique key, Check constraint and illustrate

2.0   Understand the concepts of SQL

2.1   Explain benefits of SQL
2.2   Describe about Embedded SQL, Lexical conventions, oracle tools support for SQL
2.3   Describe Naming of the Objects and parts and how to refer them
2.4   Explain literals, text and integers
2.5   Explain the different data types like character, number, long, date, raw and long raw etc.
2.6   Illustrate pseudo-columns
2.7   Illustrate the comments within SQL Statement
2.8   List and explain the functions like single row, character, conversion and group functions
2.9   Explain date and number format models
2.10   Describe commands of SQL like Data Definition Language commands, Data Manipulation Language commands, Transaction Control Commands.
2.11   Explain Sub Queries
2.12   Explain Joins and types of Joins

3.0   Understand PL/SQL

3.1   Explain the architecture of PL/SQL.
3.2   List the features of PL/SQL
3.3   Explain the data types of PL/SQL
3.4   Illustrate declarations and naming conventions of variables
3.5   List the built in functions.
3.6   Explain PL/SQL tables and user defined records.
3.7   Explain decision making statements and illustrate
3.8   Explain looping statements and illustrate
3.9   Define the term Exception handling
3.10   Illustrate built-in Exceptions
3.11   Illustrate User defined Exceptions
3.12   List the advantages of Exception handling
3.13   Explain the advantages and features of Exceptions.
3.14   Explain the propagation and re-raising of Exceptions.
3.15   Describe the advantages of sub programs.
3.16   List and explain the various statements and declarations for procedures and functions.
3.17   Explain the parameter modes in PL/SQL with examples
3.18   Illustrate parameter default values in PL/SQL procedures and functions
3.19   Explain PL/SQL global, local and system variables.
3.20   Define Recursion
3.21   Explain Recursion with an example

4.0   Understand the concepts of NoSQL.

4.1 Know the Classification of Databases : RDBMS, OLAP, NoSQL.
4.2 Introduction to NoSQL
4.3 Know the need for NoSQL
4.4 Compare RDBMS and NoSQL
4.5 Define CAP Theorem(Brewer's Theorem)
4.6 List the Advantages and Disadvantages of NoSQL
4.7 Know about the BASE system.
4.8 Compare ACID and BASE properties

COURSE CONTENTS

1. **Concepts of DBMS & RDBMS**

   Define Database – Advantages of Database- Data Abstraction – Data Models – Instances and Schemas – Data Independence – Data Definition Language- Data Manipulation Language – Database Manager – Database Administrator - Database Users – Overall system Structure.

   Entities and Entity sets – Relationships and Relationship sets – Mapping constraints – Entity – Relationship Diagram – Super key , Candidate key and Primary key - Reducing E- R Diagrams to tables – Generalization and Specialization – Aggregation – Functional Dependencies - Normal forms 1NF , 2 NF , 3 NF- E.F.CODD's rules for RDBMS- Managing tables –creating tables – alter tables – dropping tables– managing integrity constraints.

2. **Concepts of SQL**

   Benefits of SQL – Embedded SQL – Lexical conventions – ORACLE tools   support for SQL. Naming object and parts – Referring objects and parts – Referring to object. Literals – Text –Integer – Number – Data types – Character data types – Number data type – Long data type –Raw and Long Raw data types –Pseudo columns – comments within SQL statements – comments on schema objects.

   Operators – Unary and Binary operators – Precedence- Arithmetic operators – character operators – comparison operators – logical operators- se operators – other operators – functions – single row functions – numeric functions – character functions – Group functions – date functions – conversion functions – other functions- date format models .

   SQL commands, Data Definition language commands - Data Manipulation Language commands. Transaction control commands-Subqueries - Joins.

3. Elements of PL/SQL

Main features – architecture – advantage of PL/SQL – fundamentals – character set – Lexical units – Data types – data type conversion – declarations – naming conventions – scope and visibility – assignments – expressions and comparisons – built – in functions – PL/SQL tables – user defined records.

Conditional control- IF statement – sequential control- GOTO and NULL statements.

SQL support – national language support – Remote Access

Advantages of Exceptions – predefined Exceptions – user defined Exceptions – how Exceptions propagate – raising an Exception – useful techniques.

Advantages of subprograms – procedures – Functions RETURN statement – forward declarations – actual versus formal parameters – positional and named notation - parameter modes – parameter default values – recursion

4. Concepts of NoSQL

Classification of Databases : RDBMS, OLAP, NoSQL.-Introduction to NoSQL- need for NoSQL – Comparison of RDBMS and NoSQL- Definition of CAP Theorem(Brewer's Theorem) - Advantages and Disadvantages of NoSQL - the BASE system – Comparison of ACID and BASE properties – Classification of NoSQL as Key-value stores, Column-oriented, Graph and Document oriented Databases - Key-value stores Databases - Column-oriented Databases - Graph Databases - Document oriented Databases

5. Basics of MongoDB

Introduction to MongoDB - advantages of MongoDB - applications of MongoDB - Installation of MongoDB - Creation of Database - Dropping of Database - Creation of Collection - Dropping of Collection - Datatypes of MongoDB - different Commands of MongoDB - Inserting Document - Query Document - Updating Document – Deleting Documents - Sorting Documents

REFERENCE BOOKS

1. Understanding ORACLE   -- James T. Peary & Joseph G. Laseer.

2. RDBMS with ORACLE   -- Rolland.

3. ORACLE series books of ORACLE Press   – TMH.

4.Starting out with Oracle – Covering Databases   -- John Day &CraigVan

5.PL/SQL, Developer Tools & DBA   -- Slyke, Dreamtech

6.www.nosql-database.org

7.www.mongodb.org

DIGITAL ELECTRONICS LAB

Subject Title : **Digital Electronics Lab**
Subject Code : **IT-306**
Periods/Week : **03**
Periods/Semester : **45**

LIST OF EXPERIMENTS

1. Identification of Digital ICs and noting down pin details from data sheets. Identify the given digital ICs and draw the pin diagrams. (use TTL and CMOS ICs of AND, OR, NOT, NAND, NOR and XOR gates with two and three inputs)

2. Verify the truth tables of AND, OR, NOT, NAND, NOR and Ex-OR Gates

3. Realize AND , OR , NOT , XOR functions using NAND gates only, NOR gates only

4. Verify Demorgan's Laws using given digital trainer kit and given TTL gates

5. Construct Half adder and full adder circuits and verify their functionality

6. To construct clocked Flip Flops using Logic gates/Digital Trainer kits and verify its truth table.

    a)Verify the truth table of CD 4013 Dual D flip Flop

    b)Verify the functionality and truth table of 74L71 RS flip flop with Preset and Clear

    c) Verify the Truth table of JK FF using 7476 IC.

    d) Construct D and T flip flops using 7476 and verify the truth tables.

    e) Use Digital trainer kits where ever required for above experiments

7. To construct and verify the function of Asynchronous counters

8. To construct and verify the function of decade counter using 7490 ICs.

    a) change the modulus of the counter

    b) display decimal number using 7447

9. To construct and verify the function of Synchronous counters

10. To construct and verify the function of up/down counter

11. To construct and verify the function of shift register

12 . To study the features of Encoders and Decoders

13 . To study the features of Multiplexers and Demultiplexers

14 Setup a circuit of a single decimal 4-bit BCD and vice-versa using gates

15 Setup a circuit for displaying hexadecimal code on a 7 segment display

16 To verify truth table and to study the operation of tri-state output buffer

17. To verify the function of 4-bit magnitude comparator using logic gate

MULTIMEDIA LAB

Subject Title   : **Multimedia Lab**
Subject Code   : **IT – 307**
Periods per Week   : **03**
Periods per Semester : **45**

LIST OF EXERCISES

1. Practice how to scan a picture and save it in the requested format.

2. Edit the picture in the Photoshop.

3. How to work with different layers in Photoshop.

4. How to work with basic pen techniques in Photoshop.

5. How to work with vector shapes and crippling paths.

6. Practice the basic features of the Flash.

7. Create a small flash movie

8. How to apply transformations to text and graphics

9. How to add pictures and sound to the Flash movie

10. Write a program to animate on different time sequences

11. Write a program to animate on different layers.

12. Create a web page and add the text, pictures and flash movies to it.

13. Create a small CBT on any topic.

DATA STRUCTURES LAB

Subject Title   : Data Structures Lab

Subject Code   : IT – 308
Periods per Week   : 04

Periods per Semester   : 60

LIST OF EXCERCISES

1. Develop a 'C' program to create and implement a SINGLY LINKED LIST.Write functions to insert, delete, and display elements of the list.

2. Develop a 'C' program to create and implement a SINGLY CIRCULAR LINKED LIST.

3. Develop a 'C' program to create and implement a STACK using arrays.

4. Develop a 'C' program to create and implement a STACK using linked lists.

5. Develop a 'C' program to create and implement a QUEUE using arrays.

6. Develop a 'C' program to create and implement a QUEUE using linked lists.

7. Develop a 'C' program to create and implement a CIRCULAR QUEUE using arrays.

8. Develop a 'C' program to create a BINARY TREE. Write functions to perform the various traversals on the tree.

9. Develop a 'C' program to create a BINARY SEARCH TREE. Write functions to perform the various traversals on the tree.

10. Develop a 'C' program to create and implement SELECTION SORTING.

11. Develop a 'C' program to create and implement INSERTION SORTING.

12. Develop a 'C' program to create and implement BUBBLE SORTING.

13. Develop a 'C' program to create and implement MERGE SORTING on two sorted list.

14. Develop a 'C' program to create and implement LINEAR SEARCHING.

15. Develop a 'C' program to create and implement BINARY SEARCHING

DATA STRUCTURES LAB OBJECTIVES AND KEY COMPETENCIES		
Sl.No	Name of the Experiment	Objectives	Key Competencies

Sl.No	Name of the Experiment	Objectives	Key Competencies
1	Exercises on creation, insertion, deletions & display of elements in a singly linked lists	Write a C program for i. Creation of linked list ii. Inserting an element in Linked list iii. Check for deletion of a node if no element is present and print error message iv. Delete an element from the Linked list v. Display all the elements from the linked list	❖ Rectify syntactical errors ❖ Debug logical errors ❖ Study node structure ❖ Validate whether the memory allocation is done for the node ❖ Confirm whether the addition of node is done at the end ❖ Correct if deletion of an element in an empty list ❖ Confirm whether deletion of required node is done ❖ Observe whether all the elements of the linked list are displayed in proper order
2	Write a program to implement a singly circular linked list	Write a C program for i. Creation of linked list ii. The last node is pointing to the first node of the list iii. Display all the elements from the Circular linked list	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe node structure ❖ Validate whether the memory allocation is done for the node ❖ Validate whether the last node is pointing to the first node of the linked list ❖ Compare whether linked list and circular linked list is properly understood
3	Writea program to Implement a stack	Write a C program for i. Creation of Stack consisting of elements using arrays ii. Insertion of new element is done by push() function call iii. Deletion of last element is done by pop() function call iv. Print error message for 'empty stack' if no elements are present for pop() function call v. Print error message for 'stack full' if number of elements exceed size of Stack array	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe declaration of stack using arrays ❖ Validate whether a new element is inserted at the top by push() function call ❖ Check whether only the top element is deleted by pop() function call ❖ Verify for empty stack condition in pop() ❖ Verify for stack full condition in push()
4	Writea program to implement a queue	Write a C program for i. Creation of Queue consisting of elements using arrays	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe declaration of Queue using arrays

DATA STRUCTURES LAB OBJECTIVES AND KEY COMPETENCIES			
Sl.No	Name of the Experiment	Objectives	Key Competencies
		ii. Insertion of new element is done by add_Queue() iii. Print error message for 'empty queue' if no elements are present for deletion of an empty queue. iv. Print error message for 'queue full' if number of elements exceed size of Queue array upon insertion of new element. v. Deletion of first element is done by delete_Queue()	❖ Validate whether a new element is inserted at the end of the array by add_Queue() ❖ Verify for empty Queue condition for deletion of an element ❖ Verify for Queue full condition upon insertion of a new element ❖ Check whether only the first element is deleted by delete_Queue()
5	Write a program to create a binary tree & its traversal operations	Write a C program for i. Creation of Binary Trees ii. Creation of elements at proper levels iii. Insertion of a node iv. Perform In-order Traversal of the binary tree v. Perform Pre-order Traversal of the binary tree vi. Perform Post-order Traversal of the binary tree	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe proper definition of elements in a Binary Tree ❖ Check whether the node is properly inserted in the Binary Tree ❖ Validate whether the Tree in-order traversal is properly done ❖ Validate whether the Tree pre-order traversal is properly done ❖ Validate whether the Tree post-order traversal is properly done
6	Exercise on Selection sort	Write a C program for i. Implementing selection sort ii. Printing the list after selection sort is performed	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe whether selection sort algorithm is properly implemented ❖ Check whether the sorted list is generated after the selection sort is performed for the given unordered list
7	Exercise on insertion sort	Write a C program for i. Implementing insertion sort ii. Printing the list after insertion sort is performed	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe whether insertion sort algorithm is properly implemented ❖ Check whether the sorted list is generated after the insertion sort is performed for the given unordered list

	DATA STRUCTURES LAB OBJECTIVES AND KEY COMPETENCIES		
Sl.No	Name of the Experiment	Objectives	Key Competencies
8	Exercise on bubble sort	Write a C program for i. Implementing Bubble sort ii. Printing the list after insertion sort is performed	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe whether Bubble sort algorithm is properly implemented ❖ Check whether the sorted list is generated after the Bubble sort is performed for the given unordered list ❖ Check the efficiency of the program if the given list is almost sorted
9	Implement a program for merge sort on two sorted lists of elements	Write a C program for i. Implementing merge sort ii. Printing the list after merge sort is performed	❖ Correct syntactical errors ❖ Debug logical errors ❖ Check whether two separate sorted lists are properly stored in separate arrays ❖ Observe whether Merge sort algorithm is properly implemented ❖ Check whether the sorted list is generated after the Merge sort is performed for the given two separate lists
10	Exercises on linear search	Write a C program for i. Implementing Linear Search ii. Print the proper result for successful and unsuccessful search	❖ Correct syntactical errors ❖ Debug logical errors ❖ Check whether Linear Search algorithm is properly implemented ❖ Observe the result for the search element is present in the list ❖ Observe the result for the search element is not present in the list
11	Exercise on binary search	Write a C program for i. Implementing Binary Search ii. Print the proper result for successful and unsuccessful Binary search	❖ Correct syntactical errors ❖ Debug logical errors ❖ Check whether Binary Search algorithm is properly implemented ❖ Observe the result for the search element is present in the list ❖ Observe the result for the search element is not present in the list

DBMS LAB

Subject Title   :   **DBMS Lab**
Subject Code   :   **IT- 309**
Periods per week   :   **06**
Periods per Semester :   **90**

LIST OF EXCERCISES

1   Know installation of Oracle
2   Exercise on creating tables
3   Exercise on inserting records
4   Exercise on updating records
5   Exercise on modifying the structure of the table
6   Exercise on Select command
7   Exercise on querying the table using clauses like WHERE, ORDER, IN, AND, OR, NOT
8   Exercise on various group functions
9   Exercise on Number functions, character functions, conversion functions and date functions
10 Exercise on set operators
11 Exercise on sub queries
12 Exercise on Joins
13 Exercise on various date and number format models
14 Exercise on creating tables with integrity constraints
15 Write programs using PL/SQL control statements
16 Exercise on PL/SQL exception handling
17 Exercise on Procedures
18 Exercise on Functions
19 Exercise on Recursion
20 Exercise on Installation of MongoDB
21 Exercise on Creation and Dropping of Database
22 Exercise on Creation and Dropping of Collections.
23 Exercise on Commands of MongoDB- Insert ,update , find, delete and sorting of Documents.

SI.No	Name of the Experiment	Objectives	Key Competencies
		DBMS LAB	
1	Know installation of Oracle	Perform the following: i. To identify the version of Oracle being installed ii. To understand the RAM and HDD requirements for Oracle installation iii. To comprehend the installation steps correctly iv. Setting up of Oracle Administrative Password v. Configuring the Oracle database after post-installation steps of Oracle viz configuring administrative rights for performing vi. To login to Oracle as administrator account and Oracle user account	❖ Observe Oracle version being installed ❖ Observe the RAM & HDD requirements ❖ Rectify for any Oracle installation errors ❖ Able to login as Administrator and as Oracle user account
2	Exercise on creating tables	Perform the following: i. To login with Oracle user account ii. To give correct syntax for table creation iii. To give correct data type for the required fields with appropriate size iv. To display the structure of the table	❖ Correct Table creation syntax errors ❖ Correct the wrong data types and inappropriate sizes for the respective fields ❖ Check for displaying the structure of the table
3	Exercise on inserting records	Perform the following: i. Check for the required table present already ii. To insert the records correctly iii. To display the records correctly	❖ Correct syntax errors for Insertion of record ❖ Check for insertion of proper values for the required fields ❖ Verify the correct values pertaining to the record are inserted in the required table ❖ Check for displaying of the records correctly
4	Exercise on updating records	Perform the following: i. Check for the required table present already ii. To update the records	❖ Correct syntax errors for updation of record ❖ Check for updation of proper values for the required fields

DBMS LAB			
Sl.No	Name of the Experiment	Objectives	Key Competencies
		correctly iii. To display the updated records	❖ Check for displaying of the updated records correctly
5	Exercise on modifying the structure of the table	Perform the following i. To identify the required table present in the system already ii. To add new column iii. To display the records correctly	❖ Correct syntax errors in modifying the structure of the table ❖ Check whether required field is newly added to the existing table ❖ Check for displaying of the modified table correctly
6	Exercise on SELECT command	Perform the following i. To identify the required table present already ii. To display the records in the required table	❖ Check for syntax error in usage of Select command ❖ Check whether Select command is given correctly to display all the records
7	Exercise on querying the table using clauses like WHERE, ORDER, IN,AND, OR, NOT	Perform the following: i. To use the Select command ii. To use the clauses WHERE, ORDER, IN,AND, OR, NOT along with Select command on the given records in the table	❖ Check for syntax error in usage of Select command with appropriate clauses ❖ Check whether Select command along with appropriate clause is given correctly for the required condition ❖ Check the usage of clauses WHERE, ORDER, IN,AND, OR, NOT along with Select command appropriately
8	Exercise on SET operators	Perform the following i. To use set command ii. To use set command along with WHERE condition	❖ Check for syntax error in the usage of SET command ❖ Check for usage of SET command for updating values based on certain condition on few records
9	Exercise on sub queries	Perform the following i. To use Select command ii. To use appropriate Operators	❖ Check for the syntax error in usage of sub queries ❖ Check for the correctness of the usage of appropriate operators

SI.No	Name of the Experiment	Objectives	Key Competencies
		- IN	used
10	Exercise on Joins	Perform the following i. To create two tables ii. To use the common field if two tables are used iii. To know different types of Join	❖ Check for the correctness of the syntax used for joining ❖ Check if the join is created between two tables ❖ Check if self join is created
11	Exercise on various date and number format models	Perform the following: i. To use date formats correctly ii. To use number formats correctly	❖ Check for the syntax of the date formats ❖ Check for the syntax of the number formats
12	Exercise on creating tables with integrity constraints	Perform the following i. Create Primary key ii. Create Foreign key or referential integrity constraint iii. Create NOT NULL constraint iv. Create UNIQUE Key constraint v. Create CHECK constraint	❖ Check for the syntax errors in usage of all types of Integrity constraints ❖ Check whether different types of Integrity constraints are used
13	Write programs using PL/SQL control statements	Perform the following i. To use IF .. ELSE statements ii. To use iterative statements – Simple loop, While Loop, For Loop	❖ Check for the syntax of IF.. ELSE statements ❖ Check for the syntax of all iterative statements
14	Exercise on PL/SQL built-in exception handling	Perform the following i. Know about types of Exception handling ii. To handle built-in Exceptions	❖ Check for handling of built-in Exceptions ❖ Check for raising of user defined Exception ❖ Check for handling of user defined Exception with appropriate error messages
15	Exercise on PL/SQL in user defined exception handling	Perform the following i. To declare user defined exception ii. To raise user defined exception iii. To handle user defined exception	❖ Check for declaration of user defined exception ❖ Check for proper raising of exceptions ❖ Check for proper handling of user defined exception with appropriate error messages

DBMS LAB

DBMS LAB			
Sl.No	Name of the Experiment	Objectives	Key Competencies
16	Exercise on Procedures	Perform the following i. To know the concept of stored procedures ii. To declare procedures iii. The type of parameters IN,IN OUT, OUT iv. To call procedures from other procedures	❖ Check for proper declaration of procedures ❖ Check for syntax of parameters and its type ❖ Check for proper calling of procedures
17	Exercise on Functions	Perform the following i. To know the concept of stored functions ii. To declare function with return data iii. To call functions from other functions	❖ Check for proper declaration of function ❖ Check for syntax of parameters and its data type ❖ Check for proper return data type from the functions ❖ Check for variable assignment to get the returned value from the function
18	Exercise on Recursion	Perform the following i. To know the concept of stored functions and stored procedures ii. To call the procedure and function by itself iii. To place a condition to terminate from calling itself	❖ Check for the syntax of stored function or procedure ❖ Check for calling the function or procedure in the same function / procedure ❖ Check for the condition to terminate from calling itself
19	Exercise on Installation of MongoDB	Perform the following i. To download and install MongoDB	
20	Exercise on Creation and Dropping of Database	Perform the following i. Create the Database ii. Drop the Database	
21	Exercise on Creation and Dropping of Collections	Perform the following iii. Create the Collection iv. Drop the Collection	

		DBMS LAB	
Sl.No	**Name of the Experiment**	**Objectives**	**Key Competencies**
22	Exercises on commands of MongoDB	Execute the following commands of MongoDB i. Insert the Document ii. update the Document iii. find the Document iv. Delete the Document v. sort the Documents	

VI SEMESTER

DIPLOMA IN INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2016 (IV Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practical's		Duration (hrs)	Session al Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
IT-401	Computer Hardware & Networking	5	-	75	3	20	80	100
IT-402	E-Commerce	5	-	75	3	20	80	100
IT-403	Operating Systems	5	-	75	3	20	80	100
IT-404	Microprocessors	5	-	75	3	20	80	100
IT-405	Web Technologies	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								
IT-406	Computer Hardware & Networking Lab	-	6	90	3	40	60	100
IT-407	Web Technologies Lab	-	4	60	3	40	60	100
IT-408	Communications Skills		3	45	3	40	60	100
IT-409	System Administration Lab		4	60	3	40	60	100
	Total	25	17	630	-	260	640	900

* IT-401, IT-404 common with CM-401, CM-404

COMPUTER HARDWARE & NETWORKING

Subject Title   **: Computer Hardware & Networking**
Subject Code   **: IT- 401**
Periods per Week   **: 05**
Periods per Semester   **: 75**

TIME SCHEDULE

S.No	Major Topics	No. of Periods	Weightage of Marks	Short answer questions	Essay questions
1	PC Components and System Board	20	26	2	2
2	Managing Storage devices	10	16	2	1
3	Troubleshooting Fundamentals	11	16	2	1
4	Introduction to Networks and LAN components	17	26	2	2
5	Network Addressing and Management	17	26	2	2
	Total	**75**	**110**	**10**	**8**

OBJECTIVES

1.0 PC Components and System Board.
1.1 Hardware used for I/P, O/P & inside computer case, system board components used for communication among devices
1.2 Software - 3 types of Software,ROM BIOS, OS, application software
1.3 Functions of BIOS
1.4 The boot process
1.5 POST and important beep codes
1.6 Know about different connectors.
1.7 Types of system boards
1.8 The CPU & the chipset – CPU form factor, CPU slots and sockets
1.9 Different types of RAM
1.10 Buses – ISA, MCA, EISA, USB, Firewire, AGP,PCI
1.11 Setting the CPU & Bus speeds.
1.12 CMOS setup and data protection.

2.0   Managing Storage devices

2.1   Know about Semiconductor Memories – RAM,ROM on System Board
2.2   Main Memory – SIMMs, DIMMs, Other RAM Technologies
2.3   Hard drives – hard drive technology – IDE, EIDE, SCSI,SATA.
2.4   Hard drive partitions
2.5   Troubleshooting hard drives & data recovery
2.6   Optimizing Hard drive – disk cleanup, disk fragmentation. Disk backup
2.7   Know about Flash memories.
2.8   Know Functional units of optical memories(CD-ROM, DVD ROM etc)

3.0   Troubleshooting Fundamentals

3.1   Troubleshooting tools – Bootable rescue disk, diagnostic software,virus detection software, Anti-Static tools
3.2   How to isolate computer problems
3.3   Troubleshooting guidelines – Power system, system board, OS &hard drive, Optical drives,keyboard ,Monitor and printer problems.
3.4   Surge protection & battery backup
3.5   Stand by UPS, Inline UPS, Line-interactive UPS, and intelligent UPS.

4.0   Introduction to Networks and LAN components.

4.1   Understand the Overview of Networking.
4.2   State the Need for Networking.
4.3   Classification of Networks –LAN,MAN,WAN
4.4   List the Hardware and Software Components.
4.5   Various Network Communication Standards.
        4.5.1 OSI Reference Model.
        4.5.2 TCP/IP Reference Model.
4.6   Know about LAN Cables and Connectors, wireless network adapter
4.7   Know about Coaxial Cables, Twisted-Pair Cables, Optical Fiber Cables, and Connectors.
4.8   Explain LAN Devices
        4.8.1 Repeaters
        4.8.2 Hubs
        4.8.3 Switches
        4.8.4 Network Interface Cards (NICs)
        4.8.5 Routers (CISCO, DAX, Etc.)
        4.8.6 Modem (56KBPS Internal or External, ADSL Modems,Etc.)
4.9   Overview of Network Topologies.
4.10   Understand the basic Topologies such as Bus, Ring and Star, Complex

        topologies like Mesh and Hybrid Topologies.

5.0   Network Addressing and Management

5.1   Introduction to Network Addressing.
5.2   Know about TCP/IP Addressing Scheme.
        5.2.1 Components of IP Address.
        5.2.2 IP Address Classes.
        5.2.3 IP Subnetting
        5.2.4 Classify the two types of Internet Protocol addressing IPv4 and IPv6 and state the   need for IPv6.

5.2.5　Explain classful addressing and classless addressing in IPv4.
5.2.6　Describe Internet protocol version-6 (IPv6) addressing.
5.3　State the need for protocols in computer networks.
5.4　Know about protocols
    5.4.1 Hyper Text Transfer Protocol (HTTP)
    5.4.2 File Transfer Protocol (FTP)
    5.4.3 Simple Mail Transfer Protocol (SMTP)
    5.4.4 Telnet
5.5 Understand the Overview of Network Management.

5.6 Understand the Model of ISO Network Management

5.7 Understand the Network Monitoring and Troubleshooting.

5.8 Learn about Simple Network Management Protocol (SNMP).

5.9 Explain how SNMP works.

5.10 Know about Remote Monitoring (RMON).

COURSE CONTENTS

1.　PC Components and System Board.
Boot Process –BIOS- POST- Connectors
Various Types of Buses – ICA – MCA – EICA – Setting the CPU and Bus Speeds

2.　Managing and Storage Devices
Hard Drives – IDE – EIDE – SCSI, SATA- Optical Drives

3.　Troubleshooting Fundamentals
Troubleshooting – Power Systems – System Board – OS – Hard Drive – Optical Drives - Key Board –Monitor –printers

4.　Introduction to Networks and LAN components
Need for network-Network classification- network standards-Topologies-Network Components- connectors-network devices

5.　Network Addressing and Management
　Network addressing-Network protocols. Monitoring and Troubleshooting – Remote Monitoring.

REFERENCE BOOKS

1. Enhanced Guide to Managing -- Jean Andrews (Thomson)
   And Maintaining Your PC
2. Basics of Networking -- NIIT PHI publication
3. PC Hardware A Beginners Guide -- Gilster (TMH)
4. PC Upgrading -- Stephen Bigelow (TMH)
5. Trouble Shooting Your PC -- Stone & poor
6. Computer Networks -- Andrew S. Tanenbaum
7. Computer Installation & Servicing -- D. Balasubramaniam
8. Basics of Networking   --   NIIT, PHI Publications

E-COMMERCE

Subject Title   : E-Commerce
Subject Code   : IT – 402
Periods per Week   : 05
Periods per Semester : 75

		TIME SCHEDULE			
Sl.No	**Major Topics**	**Periods**	**Weightage of Marks**	**Short Questions**	**Essay Questions**
1	E-Commerce Business	15	26	2	2
2	E - C Web Site	15	26	2	2
3	Security Concerns	15	26	2	2
4	Encryption systems & Certificate Management Protocol	15	16	2	1
5	E-Commerce Site Security	15	16	2	1
	TOTAL	75	110	10	8

On completion of the study of the subject a student should be able to comprehend the following:

1.0   E-Commerce Business

      1.1   E – Commerce – an introduction

      1.2   Categories of E – Commerce sites – B – to – B sites, B – to – C sites, C – to – C sites, G – to – C sites, B – to – G sites,

      1.3   Types of E – Commerce Sites – Educational, Financial, Auction, News, Entertainment, Children's, Adult Sites.

      1.4   Modes of payment – Credit cards, Debit cards, Smart cards, E – credit accounts, E – Money, American Clearing HOUSE(ACH), Electronics Funds Transfer(EFT), PayPal, Revolving Credit Accounts

      1.5   Concerns related to E – Commerce – Business, Customer concerns

      1.6   Ethics in E – Commerce transactions

2.0   E-Commerce Web Site

    2.1   Introduction

    2.2   Planning the Web Site – Selecting a Domain name, Registering a Domain name, Meeting the statutory Requirements

    2.3   Designing a Web Site – Conceptualization, Structure and layout, Web Hosting, Disclaimers and Copyrights.

    2.4   Supply Chain Management – Inventory, Vendor Management

    2.5   Testing the Web Site – Media Testing, Security Testing, Privacy Policy

    2.6   Launching the Web Site

3.0   Security Concerns

    3.1   Identifying various security threats

    3.2   Environmental Threats – Nature – related, Infrastructure – related and internet – related threats.

    3.3   Human Threads – Social engineering, Criminal intent, Terrorist Threats

    3.4   Ensuring of secure environment – Providing security, choosing the Correct Web architecture, ensuring data integrity, ensuring authorization, Security policy, privacy policy, electronic communication and privacy act (ECPA – 1986), Cryptography and encryption.

4.0   Encryption systems and Certificate – Management protocols

    4.1   Introduction

    4.2   Types of encryption systems – Email based, network protocols based.

    4.3   Acquiring Certificates: The procedure

    4.4   Certificate - Management – CMP, SCEP, CMC

5.0   E-Commerce Site Security

    5.1   Corporate network structure

    5.2   Threats to network security

    5.3   Corporate network security solutions – perimeter security, fire wall security, Demilitarized zone, Virtual private networks. Intrusion – detection systems, AAA model, Orange Book, ITSEC Document, Common Criteria Document.

    5.4   Corporate security policy – Elements, Features, Development.

5.5   Comprehend on Venture Capital Appreciate the Case Studies on E – commerce Sites.

5.6   Define Venture Capital.

5.7   Explain the concept of venture capital.

5.8   Explore the history of venture capital.

5.9   List and explain the stages on venture funding.

5.10   Define and explain structuring a deal in E – Commerce.

5.11   Explain the concept of stocks and shares.

5.12   Explore the venture capital in India.

5.13   Explore the venture capital in global conditions.

5.14   Explain the different financing options in venture capital.5.15   Explore any two E – Commerce sites.

COURSE CONTENTS

1.0   E-Commerce Business
Introduction - Categories of E – Commerce site -Types of E – Commerce Sites – Moods of payment – Concerns related to E – Commerce - Ethics in   E – Commerce transactions.

2.0   E-Commerce Web Site
Introduction - Planning the Web Site – Designing a Web Site – Supply Chain Management –Testing the Web Site – Launching the Web Site.

3.0   Security Concerns
Identifying various security threats - Environmental Threats – Human Threats - Ensuring of secure environment.

4.0   Encryption systems and Certificate – Management protocols
Introduction - Types of encryption systems – Acquiring Certificate - Certificate Management protocols

5.0   E-Commerce Site Security
Corporate network structure - Threats to network security - Corporate network security solutions - Corporate security policy.

RE FE RE NCE BO O KS

1.   Basics of E – Commerce Legal and Security Issues – NIIT (PHI)
2.   E-Commerce   Gary P.Schneider – James
3.   E-Commerce   T. Perry(Thomson).
4.   E-Commerce   Greenstein(TMH) Joseph(PHI)

OPERATING SYSTEMS

Subject Title   : **Operating Systems**
Subject Code   : **IT– 403**
Periods per Week   : **05**
Periods per Semester : **75**

TIME SCHEDULE

S.No	Major Topics	No. of Periods	Weightage of Marks	Short answer questions	Essay questions
1	**Introduction to Operating System**	12	16	2	1
2	**Process Management**	25	39	3	3
3	**Storage management**	17	26	2	2
4	**Secondary storage management**	13	16	2	1
5	**Files and Protection**	8	13	1	1
	Total	**75**	**110**	**10**	**8**

OBJECTIVES

On completion of the study of thecourse the student shall be able to

1   Know about basics of operating systems.

     1.1   Define an operating system.
     1.2   Discuss history of operating system.
     1.3   Discus about various operating systems.
     1.4   Distinguish spooling and buffering.
     1.5   Explain the concepts like multiprogramming and timesharing.
     1.6   Differentiate between distributed and real time systems.
     1.7   Describe multiprocessor systems.
     1.8   Understand the operating system components.
     1.9   Discuss operating system services.
     1.10   Define system call with an example.
     1.11   List different types of system calls.
     1.12   Define single, multi user operating system structure.

2   Understand process management.

     2.1   Define processes.
     2.2   Understand a) sequential process b) process state diagram c) process control block.
     2.3   Describe process creation and termination.

2.4   Understand the relation between processes.
2.5   Describe threads and multithreading.
2.6   Explain scheduling concepts.
2.7   Describe scheduling queues and schedulers.
2.8   Explain C.P.U. scheduling and scheduling criteria.
2.9   Explain various scheduling algorithms – FIFO, SJF, Round Robin, Time sharing, Multilevel scheduling, Multilevel feedback Queue scheduling.
2.10   Describe semaphores.
2.11   Explain inter process communication.
2.12   Define a deadlock.
2.13   State the necessary conditions for arising deadlocks.
2.14   State various techniques for deadlock prevention.
2.15   Discuss briefly deadlock avoidance and detection.
2.16   Describe the process of recovering from deadlock.

3   Understand the storage management.

3.1   Describe briefly address binding, dynamic loading, dynamic linking,overlays.
3.2   Describe briefly on swapping.
3.3   Explain single partition allocation.
3.4   Explain multiple partition allocation.
3.5   Explain paging concept.
3.6   Explain briefly segmentation.
3.7   Define virtual memory techniques.
3.8   Describe briefly demand paging.
3.9   Describe page replacement.
3.10   Discuss briefly on page replacement algorithms - FIFO, LRU, optimal.
3.11   Define concept of thrashing.
3.12   Explain working set model and page fault frequency.

4.0   Understand the secondary storage management.
4.1   Explain disk structure.
4.2   Understand free space management.
4.3   Describe various allocation methods.
4.4   Explain various disk scheduling algorithms- FCFS, SST, Scan, C-Scan,Look.

5.0   Understand file system and protection.

5.1   Define file management.
5.2   List and explain various file operations.
5.3   List and explain various access methods.
5.4   Explain directory structure organization.
5.5   Describe the concept of file protection.

COURSE CONTENTS

1. **Introduction to operating system**

Introduction – History of operating system – Operating system concepts – Operating system structure – Overview of operating system functions- types system calls- single and multi-user operating system structure.

2. **Processor management**

Introduction to processor – Job programs – Job scheduling – Process scheduling – Process synchronization – Process communications – Deadlocks.

3. **Storage management**

Memory management – Paging – Swapping – Virtual memory – Page replacement algorithms – working set model – page fault frequency.

4. **Secondary storage management**

Disk structure – Free space management – Allocation methods – Scheduling methods – Hierarchy.

5. **File systems**

Introduction to file systems – File system design – File servers – Security – Protection mechanism.

REFERENCE BOOKS

1.   Operating Systems   --   Silberschatz and Galvin

2.   Operating Systems   --   Dietel and Dietel

 3.   Operating Systems   --   Dhamdhere (TMH)

4.   Advanced Operating Systems   --   Tanenbaum

MICROPROCESSORS

Subject Title : **Microprocessors**
Subject Code : **IT– 404**
Periods per Week : **05**
Periods per Semester : **75**

Unit No.	Major Topics	No. of Periods	Weightage of marks	Short Answer Questions	Essay Questions
1	8086 :: Introduction & Architecture	12	11	2	½
2	Instruction Set of 8086	18	26	2	2
3	Interrupts & Assembly Language Programming	25	34	3	2 ½
4	Intel Advanced Processors	07	13	1	1
5	Architecture of 8051 Microcontroller	13	26	2	2
	Total	**75**	**110**	**10**	**8**

OBJECTIVES

On completion of the study of the course the student shall be able to:

1.0 Explain the architecture of 8086 microprocessor.
    1.1 Define Micro-Computer and Microprocessor.
    1.2 Describe how a Micro-Computer fetches and executes an Instruction.
    1.3 Explain 8086 internal architecture.
    1.4 List registers and other parts in 8086.
    1.5 Describe the function of each block in 8086.
    1.6 Demonstrate how 8086 calculates memory addresses.
    1.7 Describe the Pins and signals of 8086.
    1.8 Illustrate the bus cycles and timing diagram of 8086.

2.0 Understand the instruction set of 8086
    2.1 Explain addressing modes of 8086 with examples.
    2.2 Classify the Instruction set of 8086.
    2.3 Use Data transfer instructions of 8086.

2.4   Use Arithmetic instructions of 8086.
2.5   Use Logical instructions of 8086.
2.6   Use Processor Control instructions of 8086.
2.7   Use instructions affecting flags of 8086.
2.8   Use Control transfer (branching) instructions of 8086.
2.9   Use String manipulation instructions of 8086.
2.10 Describe assembler directives.
2.11 Describe the use of various assembly language development tools like Editor, Assembler, Linker, Locator and Debugger.

3.0   Understand Interrupts and write assembly language programs
3.1   Define interrupt.
3.2   State the need of interrupt.
3.3   Classify the interrupts.
3.4   Understand the Interrupts of 8086.
3.5   Explain the interrupt handling process in 8086.
3.6   Explain Programmable interrupt controller 8259.
3.7   Understand the significance of assembly language Programming.
3.8   Describe the procedure for executing an assembly language program with assembler.
3.9   Explain Conditional and Loop statements.
3.10 Write simple assembly language programs using Conditional and Loop statements.
3.11 Explain procedural programming in 8086.
3.12 Illustrate CALL, RETURN instructions and parameter passing.
3.13 Write simple program using procedure and parameter passing.

4.0   Compare various Intel advanced processors
4.1   Compare/Contrast the features of 80286, 80386, 80486 processors.
4.2   Explain the architecture of Pentium microprocessor.
4.3   Compare/Contrast the features of Advanced Pentium processors.

5.0   Comprehend the architecture of Microcontroller 8051
5.1   List the features of Microcontrollers.
5.2   Compare Microprocessors and Microcontrollers.
5.3   Draw the block diagram of a microcomputer and explain the function of each block.
5.4   Give the details of 8051 Microcontroller family chips.
5.5   Give the functional block diagram of 8051 Microcontroller
5.6   Draw the register structure of 8051and explain.
5.7   Explain the function of various special function registers.
5.8   Give the pin diagram of 8051 Microcontroller and specify the purpose of each pin.
5.9   Describe internal memory, external memory and ports of 8051.
5.10 Explain counters & timers in 8051
5.11 Explain serial input/output of 8051
5.12 Explain interrupts in 8051.
5.13 Describe different modes of operation.

COURSE CONTENT

1.0   INTRODUCTION AND ARCHITECTURE

Define Micro computer, Microprocessor - How a Microcomputer fetches and executes an instruction - 8086 Internal Architecture – Functions of 8086 queue - How 8086 calculates memory addresses - Pins and signals of Intel 8086 - Bus cycles and timing diagram

2.0   INSTRUCTION SET OF 8086

Introduction - Addressing modes of 8086 - Instruction execution time - Instruction affecting flags - Data transfer instructions - Arithmetic instructions - Logical instructions - String manipulation instructions - Understand the control transfer (branching) instructions of 8086 - String manipulation instructions – Assembler directives - Various assembly language development tools.

3.0   INTERRUPTS AND ASSEMBLY LANGUAGE PROGRAMMING

Interrupts and its classification – Interrupts of 8086 – Programmable Interrupt controller 8259 - Assembly language programming - Executing assembly language program with assembler - Examples on conditional and loop statements - Illustrating procedure CALL and RETURN, Parameter passing and Procedure passing.

4.0   INTEL ADVANCED PROCESSORS

Introduction - Comparison of 80286, 80386 and 80486 processors - Pentium Microprocessor - Architecture of Pentium Processor - Comparison of Advanced Pentium processors.

5.0   ARCHITECTURE OF 8051

Block diagram of Microcontroller, Block diagram of 8051, Pin diagram of 8051, Registers, Timers, Interrupts, Fetch cycle, Execute cycle, Machine cycle

REFERENCE BOOKS

1.   Microprocessors & Interfacing   --   Douglas V.Hall

2.   X86 microprocessor programming   --   Venugopal and Rajkumar, TMH

3.   Advanced Microprocessors and Peripherals -- A K RAY, K M Bhurchandi, TMH

4.   8051 Micro controller by Mazidi and Mazidi.

5.   8051 Micro controller by Kenneth J. Ayala.

WEB TECHNOLOGIES

Subject Title   **: WEB TECHNOLOGIES**
Subject Code   **: IT-405**
Periods per Week   **: 5**
Periods per Semester   **: 75**

TIME SCHEDULE & BLUE PRINT

S.No	Major Topic	Periods	Weightage of marks	Short Type	Essay Type
1	Principles of Web design	4	3	1	-
2	HTML & CSS	18	29	3	2
3	XML & Web Servers	11	16	2	1
4	JavaScript	18	31	2	2 ½
5	PHP	24	31	2	2 ½
	Total	75	110	10	8

OBJECTIVES

On completion of the study of the course the student shall be able to:

1. Explain the principles of Web Designing.
   1.1   Describe the anatomy of web page.
   1.2   Illustrate the format of web page.
   1.3   Identify various Web page elements.
   1.4   Explain the process of navigation through web pages
   1.5   State the steps in building a web site
   1.6   State the steps in launching a web site.
   1.7   State the steps in maintaining a web site.

2. Use various HTML tags and apply style sheets.
   2.1   Describe the importance of HTML.
   2.2   Use the basic tags <html>, <head>, <title>, <body>.
   2.3   Use the following tags with attributes,
   - <h1> to <h6>
   - <q>
   - <strong>
   - <cite>
   - <big>
   - <small>
   - <ins>
   - <del>
   2.4   Use the following presentation tags with attributes,
   - <b>
   - <i>
   - <u>
   - <strike>
   - <sub>

- <sup>
- <center>
- <font>
- <marquee>.

2.5 Use the hyperlink and imaging tags with attributes.

2.6 **Use <div> tag with attributes**.

2.7 Use the <object> tag with all important attributes.

2.8 Use the listing tags along with attributes.

2.9 Use colors to various HTML elements.

2.10 Use the following table creation tags with attributes,
- <table>
- <col>
- <colgroup>.
- <tr>
- <td>
- <th>
- <tbody>
- <thead>
- <tfoot>

2.11 Use the following control tags with attributes,
- <form>
- <input>
- <button>
- <label>
- **<select> and <option>**
- <textarea>
- **<fieldset> and <legend>.**

2.12 Use the following frame tags with attributes,
- <frame>
- <frameset>
- <noframe>
- <iframe>.

2.13 Apply cascading style sheets
  2.13.1 Create Inline styles.
  2.13.2 Create embedded style sheets.
  2.13.3 Resolve style conflicts.
  2.13.4 Link external style sheets to a HTML page.
  2.13.5 Place HTML elements at required position.
  2.13.6 Change background colors, images etc.
  2.13.7 Set the properties margin, padding, height, width to an element.

2.14 List the applications of HTML.

3. **Create XML file, explain about parsing and explain about web servers.**
  3.1 Create XML file
    3.1.1 Describe the organization of data in the form of XML.
    3.1.2 State the significance of Namespace
    3.1.3 Explain about DTD and XML Schema.
  3.2 Explain about parsing:
    3.2.1 Need for parsing.
    3.2.2 Explain about Document Object Model (DOM) and its types:
      3.2.2.1 HTML DOM
      3.2.2.2 XML DOM

3.3 Explain about Web servers
- 3.3.1 Distinguish Client-side and Server-side scripting.
- 3.3.2 Illustrate the architecture of Web server.
- **3.3.3 Understand the working of HTTP.**
- 3.3.4 Identify various HTTP request types and their difference.
- 3.3.5 Understand the installation process of IIS and Apache web servers.
- 3.3.6 Compare/Contrast IIS and Apache.
- 3.3.7 Describe the steps to place and request HTML documents from web servers.

4. Implement client side scripting using Java Script.

- 4.1 Describe the need for client side scripting.
- 4.2 List various client side scripting languages.
- **4.3 Understand JavaScript syntax.**
- **4.4 Explain data types and variables in JavaScript.**
- 4.5 Use various operators.
- 4.6 Use **if, if/else** and **switch** conditional statements.
- 4.7 Use **while**, **do/while** and **for** iterative statements.
- 4.8 Write small programs using conditional and iterative statements.
- 4.9 Understand the process of debugging JavaScript code.
- 4.10 Implement functions
  - 4.10.1 Define and call a function.
  - 4.10.2 Illustrate parameter passing.
  - 4.10.3 List and explain global functions provided by JavaScript.
  - 4.10.4 Explain the scope and lifetime of variables.
  - 4.10.5 Write small programs using recursion.
- 4.11 Implement arrays
  - 4.11.1 Understand single and multi-dimensional arrays.
  - 4.11.2 Declare an array.
  - 4.11.3 Manipulate an array.
  - 4.11.4 Write small programs using arrays.
- 4.12 List various Objects provided by JavaScript.

5. Implement Server side scripting using PHP.

- 5.1 Understand the installation of PHP
- 5.2 Explain the fundamentals of PHP
  - 5.2.1 Combine HTML and PHP.
  - 5.2.2 List and explain various Data types with examples.
  - 5.2.3 Declare variables and constants.
  - 5.2.4 Use various Operators.
- 5.3 Implement various loop statements with examples
- 5.4 Implement various conditional statements with examples
- 5.5 Understand string manipulation using string functions
- 5.6 Write small programs using loops and conditional statements
- 5.7 Implement arrays
  - 5.7.1 Understand single and multi-dimensional arrays.
  - 5.7.2 Declare an array.
  - 5.7.3 Manipulate an array.
  - 5.7.4 Write small programs using arrays.
- 5.8 Implement functions
  - 5.8.1 Define user defined function.
  - 5.8.2 State the importance of user defined function.
  - 5.8.3 Describe the process of passing arguments.
  - 5.8.4 Explain the scope and lifetime of variables.

          5.8.5   Write small programs using functions.
    5.9   Implement the concept of accessing databases
          5.9.1   Understand basic database concepts.
          5.9.2   Explain the steps for connecting to a database
          5.9.3   List and explain the steps to do the following,
               5.9.3.1   Retrieving data from a table.
               5.9.3.2   Inserting data into a table.
               5.9.3.3   Updating the data in a table.
               5.9.3.4   Deleting data from a table.
          5.9.4   Write some simple programs to insert, delete, update and retrieve data from database.
    5.10   Describe the significance cookie and session
          5.10.1   Define Session and Cookie.
          5.10.2   State the importance of Session and Cookie.
          5.10.3   Create and delete a cookie.
          5.10.4   Use query string to pass data.
          5.10.5   Understand Session function.
          5.10.6   Use session variables.
    5.11   Explain the process of debugging PHP code.

COURSE CONTENTS

1.   ***PRINCIPLES OF WEB DESIGN***

Anatomy of Web page, Format, Elements, Navigation, Building, Launching and maintaining web site

2.   **HTML & CSS**

HTML – Introduction, Format of web page, Tags and attributes, Formatting text, Adding images, Positioning. Lists, Colors, Connecting to hyperlinks, Tables, Forms, Frames

CSS – Introduction, Inline styles, Embedded style sheets, Conflicting styles, Linking external style sheets, Positioning elements, Backgrounds, Element dimensions

3.   **XML & Web Servers**

XML – Introduction, Structuring Data, XML Namespaces, DTD and Schemas.

Parsing -- Document Object Model (DOM), Types of DOM.

Web Servers – Introduction, HTTP Request Types, System Architecture, Client-Side versus Server-Side Scripting, Accessing Web Servers, IIS, Apache, Requesting HTML, PHP documents

4.   **JAVA SCRIPT**

Introduction to Scripting, Introduction to JavaScript, Data types, variables, Operators, Conditional Statements, Iterative Statements, Debugging

Functions – Function definitions, Duration of Identifiers, Scope rules, Global functions, Recursion

Arrays – Declaring and allocating arrays, References and reference parameters, Passing arrays to functions, Sorting and Searching arrays, Multiple-Subscripted arrays

Objects – **Math** object, **String** object, **Date** object, **Boolean** and **Number** object.

4.   PHP

Fundamentals of PHP, Loops, Strings, Statements, Arrays, Functions, Databases, Cookies, Sessions, Debugging

REFERENCE BOOKS

1) Principles of Web Design, Sklar, TMH
2) HTML complete reference, Powell, THH
3) Internet & World Wide Web , Dietel and Dietel, Pearson education Asia.
4) Straight to the point PHP, Laxmi Publications
5) Basics of Web Site Design, NIIT – PHI
6) WWW Design with HTML, Xavier (TMH)

COMPUTER HARDWARE & NETWORKING LAB

Subject Title   **: Computer Hardware & Networking Lab**
Subject Code   : IT – 406
Periods per Week   **: 06**
Periods per Semester   **: 90**

LIST OF EXPERIMENTS

1.   Identify motherboard components

2*.*   RAM identification, removal, installation.

3.   CMOS setup.

4.   Print a summary of your system Hardware.

5.   Upgrading memory.

6.   Hard drive, optical drive installation.

7.   How to recover lost data on hard drive.

8.   Trouble shooting keyboard ,monitor, printer-

      a) few keys   do not work.

      b) keyboard does not work at all.

      c) key continuous to repeat after being released.

      d) key produces wrong character.

      e) Power light (led) does not go on, no picture.

      f) Power   LED light is on no picture power up .

      g) Power on but monitor display wrong character.

      h) Monitor flickers has wary lines.

      i) Screen goes blank 30 seconds or minute after the keyboard is left   untouched

9.   Printer Problems

      9.1   laser printer:

a) Printer never leaves warm-up mode.

b) Paper Jam message is displayed

c) Printed messages are distorted

9.2   DMP

a) Print head moves back and forth but nothing prints.

b) Print self test works but printing from a computer application does not work etc.,

10. Installation of operating system

11. Installation of Network card.

12. Preparing the UTP cable for cross and direct connections using crimping tool.

13. Installation of a switch and connecting systems to a network switch.

14. Installation of a modem (internal, external or USB) and connecting to internet.

15. Using FTP for uploading and downloading files.

16. Installation and configuring the proxy server for internet access.

17. Work with IP scanner software.

18. Install and configure Virtual Machine.

19. Install Router OS in Virtual Machine.

WEB TECHNOLOGIES LAB

Subject Title   **: WEB TECHNOLOGIES LAB**

Subject Code   **: IT - 407**
Periods per Week **: 4**
Periods per Semester **: 60**

LIST OF EXPERIMENTS

1. Create a HTML page that uses the tags like head, title, body etc.

2. Create a HTML page that uses frames and different presentation formats, colors.

3. Create a HTML page with a table consisting of a header, body and footer.

4. Create a HTML page with a form containing various controls.

5. Create a style sheet to set the background color, position and dimensions of a HTML element.

6. Create a simple XML file that contains student data.

7. Write JavaScript code using arithmetic operators.

8. Write JavaScript code to implement sorting.

9. Write JavaScript code that uses recursion.

10. Write JavaScript code that displays date in various formats.

11. Write PHP program using arithmetic operators.

12. Write PHP program to implement searching.

13. Write PHP program to perform various operations on a database table using functions.

14. Write a PHP program to set a cookie.

COMMUNICATION SKILLS
(Common to all Branches)

Subject title   :   **Communication skills**
Subject code   :   **IT-408**
Periods per week   :   **3**
Periods per semester   :   **45**

Introduction :

In the context of globalization , competence in speaking skills is the need of the hour The gap between the needs of the industry and the curriculum can be bridged by enabling the students to hone their speaking and listening skills. This course aims at providing opportunities for practicing speaking.

Time Schedule

Sno.	Topic	Periods	Weightage of marks (End Exam)	Sessional marks	Total
1	Listening I	3			
2	Listening II	3	10	10	20
3	Introducing oneself	3			
4	Describing objects	3			
5	Describing events	3			
6	Reporting past incidents	3			
7	Speaking from observation / reading	3	50	30	80
8	JAM	6			
9	Group discussion	6			
10	Mock interviews	6			
11	Making presentations	6			
		45	60	40	100

Objectives :

On completion of the course the students will be able to

- Strengthen their listening skills
- Strengthen their speaking skills

Competencies and key competencies to be achieved by the student

Topic	Teacher's input/ methodology	Students competence
Listening I Listening II	Pre- Listening –eliciting, pictures While - Listening Post –Listening –project , writing	Identifying the main idea, Identifying specific details, Identifying parallel and contradictory ideas Drawing inferences, Reasoning
Introducing oneself	Kinds of introduction --official/ personal, dynamic vocabulary, Body language, Model introduction, Use of line ups	Use of simple present tense, Sequencing, Appropriate vocabulary
Reporting incidents	Group work /pair work, Elicit, Use of past tense, Student presentations	Use of past tense, Relevant vocabulary

Topic	Teacher's input/ methodology	Students competence
Describing objects	Vocabulary , Use of adjectives, Games—I spy, Group presentations	Use of adjectives, Dimensions,shapes Compare and contrast, sequence
Describing events	Group work/pair work Use of appropriate tense	Use of appropriate tense, sequencing
Reporting past incidents	Use of past tense, Vocabulary Student presentations	Use of past tense , sequencing
Speaking from observation/reading	Group work/pair work, Reading techniques ,	Use of past tense, Summarising , evaluating, comprehension

JAM	Effective techniques , Good beginning , conclusion, tips, Use of line ups	Vocabulary, Sequencing, Fluency, Thinking spontaneously
Group discussion	Expressing opinion, body language,	Expressing opinion, agree/ disagree, fluency,Persuasive and leadership skills
Mock interview	FAQs , body language	Role play, body language,
Making presentations	Student presentations	Using charts , pictures, interpreting data, sequencing,PPTs

Communicative methodology (CLT) should be used to create an interactive class. Apart from the suggestions given teachers are free to innovate to use any activity to improve the language competence of students . Attention can also be given to improve the accent and intonation of students.

Note:

* This subject   is a theory subject.

** The workload should be calculated as theory workload.

***Examinations in the subject will be treated as a practical one.

SYSTEM ADMINISTRATION LAB

Subject Title   **: SYSTEM ADMINISTRATION LAB**

Subject Code   **: IT - 409**
Periods per Week   **: 4**
Periods per Semester **: 60**

1. Installation of windows 2008 server.

2. Create Users and Groups in Windows 2008 server

3. Installation of and configuration of IIS in Windows 2008 Server.

4. Installation and Configuration DHCP in Windows 2008 Server.

5. Installation and Configuration DNS in Windows 2008 Server.

6. Install and configure Active Directory in Windows 2008 Server.

7. Practice writing group policies in Windows 2008 Server.

8. Installation of LINUX

9. Create Users and Groups in LINUX system.

10. Configuring DHCP and DNS in Linux

11. Practice popular Linux commands.

12. Write and execute at shell programs in Linux

13. Write and Execute a C Program in Linux

14. Write and Execute a C Program using Fork() system call in Linux

V SEMESTER

DIPLOMA IN INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2016 (V Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
IT-501	Industrial Management & Smart Technologies	5	-	75	3	20	80	100
IT-502	.NET Programming with C#	5	-	75	3	20	80	100
IT-503	OOP Through Java	5	-	75	3	20	80	100
IT-504	Mobile Application Development	5	-	75	3	20	80	100
IT-505	Advances in Information Technology	6	-	90	3	20	80	100
PRACTICAL SUBJECTS								
IT-506	OOP Through Java Lab	-	4	60	3	40	60	100
IT-507	.NET Programming Lab Practice	-	6	90	3	40	60	100
IT-508	Life Skills	-	3	45	3	40	60	100
IT-509	Mobile Application Development Lab	-	3	45	3	40	60	100
	Total	26	16	630	-	260	640	900

* IT-501,IT-502,IT-503,IT-504 common with CM-501,CM-502,CM-402,CM-504

Industrial Management & Smart Technologies

Subject Title	:	**Industrial Management & Smart Technologies**
Subject Code	:	**IT-501**
Periods/Week	:	**5**
Period/Semester	:	**75**

TIME SCHEDULE

S. No.	Major Topics	Periods	Weightage Of Marks	Short Answer Questions	Essay Type Questions
1.	Basics of Industrial Management	06	13	1	1
2.	Organisation structure & Organisational behaviour	10	18	1	$1^{1/2}$
3.	Production Management	10	18	1	$1^{1/2}$
4.	Materials Management	08	13	1	1
5	Maintenance management & Industrial Safety	08	13	1	1
6	Entrepreneurship Development	08	13	1	1
7	Total Quality Management	05	06	2	
8	Smart technologies	20	16	2	1
	Total	**75**	**110**	**10**	**08**

1.   Basics of Industrial Management

On completion of the course the student will be able to
1.0   Understand the principles of management as applied to industry.
   1.1   Define industry, commerce (Trade) and business.
   1.2   Know the need for management.
   1.3   Understand the evolution of management
   1.4   Understand functions of Management.
   1.5   Explain the principles of scientific management.
   1.6   Explain the principles of management.
   1.7   Differentiate between management and administration.
   1.8   Understand the nature of management as a profession
   1.9   Differentiate between supervisory, middle and Top level management
   1.10   Explain the importance of managerial skills (Technical, Human, Conceptual)

2.   Organisation Structure & organisational behaviour

Know types of ownerships, the organisation structure of an industry and the behaviour of an

individual in an organisation.

   2.1   Understand the philosophy and need of organisation structure of an industry.
   2.2   Understand the line, staff and Functional organisations
   2.3   Understand the Authority and Responsibility Relationships
   2.4   Understand the differences between Delegation and decentralization
   2.5   Explain the factors of effective organisation.
   2.6   Outline the communication process

2.7　　State motivation theories.
2.8　　State Maslow's Hierarchy of needs.
2.9　　List out different leadership models.
2.10　　Explain the trait theory of leadership.
2.11　　Explain behavioural theory of Leadership.
2.12　　Explain the process of decision making.
2.13　　Assessing Human resource requirements
2.14　　Know the concept of Job analysis, Job description and specifications
2.15　　Understand the process of recruitment, selection, training and development
2.16　　Understand types of business ownerships
2.17　　Differentiate between the business ownerships
2.18　　Know the objectives of Employee participation
2.19　　Understand the meaning and definition social responsibilities
2.20　　Corporate social responsibility

3. **Production management**

Understand the different aspects of production management.

3.1　　Identify the factors of Plant Location
3.2　　Know the objectives of plant Layout
3.3　　Understand the principles of plant Layouts
3.4　　Explain the types of plant Layouts
3.5　　Relate the production department with other departments.
3.6　　State the need for planning and it's advantages.
3.7　　Explain the stages of Production, planning and control.
3.8　　Know the basic methods demand forecasting
3.9　　Explain routing methods.
3.10　　Explain scheduling methods.
3.11　　Explain dispatching.
3.12　　Explain Break Even Analysis
3.13　　Define supply chain Management, competitive strategy, Supply chain strategy
3.14　　Draw PERT/CPM networks.
3.15　　Identify the critical path

4. **Materials Management**

Understand the role of materials management industries.

4.1　　Explain the importance of materials management in Industry.
4.2　　Know Functions of Materials Management
4.3　　Derive expression for inventory control.
4.4　　Explain ABC analysis.
4.5　　Define safety stock.
4.6　　Define reorder level.
4.7　　Derive an expression for economic ordering quantity.
4.8　　Know the functions of Stores Management,
4.9　　Explain types of store layouts.
4.10　　List out stores records.
4.11　　Explain the Bin card.
4.12　　Describe Cardex method.
4.13　　Explain general purchasing procedures
4.14　　Explain tendering, E-tendering and E-procurement procedures
4.15　　List out purchase records.
4.16　　Know the applications of RFID (Radio Frequency Identification Device)
4.17　　Understand the applications of RFID in material management

5. **Maintenance Management & Industrial Safety**

Comprehend the Importance of Maintenance Management & Safety procedures

5.1 Explain the importance of maintenance management in Industry.
5.2 Know the Objectives of maintenance management
5.3 Know the activities of maintenance management
5.4 Understand the importance of Preventive maintenance
5.5 Understand the need for scheduled maintenance
5.6 Differentiate between scheduled and preventive maintenance
5.7 Know the principles of 5 s for good house keeping
5.8 Explain the importance of safety at Work place.
5.9 List out the important provisions related to safety.
5.10 Explain hazard and accident.
5.11 List out different hazards in the Industry.
5.12 Explain the causes of accidents.
5.13 Explain the direct and indirect cost of accidents.
5.14 Understand the types of emission from process Industries, their effects on environment and control
5.15 Understand the principles of solid waste management

6. Entrepreneurship Development.

Understand the role of entrepreneur in economic development and in improving the quality of life.

6.1 Define the word entrepreneur.
6.2 Explain the requirements of an entrepreneur.
6.3 Determine the role of entrepreneurs in promoting Small Scale Industries.
6.4 Describe the details of self-employment schemes.
6.5 Characteristic of successful entrepreneurs
6.6 Explain the method of site selection.
6.7 List the financial assistance programmes.
6.8 List out the organisations that help an entrepreneur
6.9 Know the use of EDP Programmes
6.10 Understand the concept of make in India, Zero defect and zero effect
6.11 Understand the importance for startups
6.12 Explain the conduct of demand surveys
6.13 Explain the conduct of a market survey
6.14 Evaluate Economic and Technical factors.
6.15 Prepare feasibility report study

7. Total Quality Management:

Understand the concepts adopted in total quality management

7.1 Explain the concept of quality.
7.2 List the quality systems and elements of quality systems.
7.3 State the principles of quality Assurance.
7.4 Understand the basic concepts of TQM
7.5 Know the Pillars of TQM
7.6 List the evolution of ISO standards.
7.7 Explain ISO standards and ISO 9000 series of quality systems.
7.8 List the beneficiaries of ISO 9000.
7.9 Explain the concepts of ISO 14000
7.10 Know the overview of PDCA cycle

8. Smart Technologies

8.1 Get an overview of IoT
8.1.1 Define the term IoT
8.1.2 Know how IoT work
8.1.3 List the key features of IoT

8.1.4   List the components of IoT : hardware, software, technology and protocols
8.1.5   List the advantages and disadvantages of IoT
8.2 IoT Applications
  8.2.1   Smart Cities
  8.2.2   Smart Energy and the Smart Grid
  8.2.3   Smart Transportation and Mobility
  8.2.4   Smart Home, Smart Buildings and Infrastructure
  8.2.5   Smart Factory and Smart Manufacturing
  8.2.6   Smart Health
  8.2.7   Food and Water Tracking and Security
  8.2.8   Social Networks and IoT

Course Content

1.   Basics of Industrial Management
Introduction: Industry, Commerce and Business; Definition of management; Characteristics of management; Functions of management - Planning, Organizing, Staffing, Directing, Co-ordination, Controlling, Motivating, Communication, Decision Making; Principles of scientific management: – F.W.Taylor, Principles of Management: Henry Fayol; Administration and management; Nature of management; levels of management; managerial skills;

2.   Organisation Structure & organisational behaviour
Organizing - Process of Organizing; Line/Staff and functional Organizations, Decentralization and Delegation, Effective Organizing; Communication, Motivational Theories; Leadership Models; Human resources development; Forms of Business ownerships: Types – Sole proprietorship, Partnership, Joint Stock Companies, Cooperative types of Organizations; Employee participation in management; Corporate Social responsibility;

3.   Production management
Definition and importance; Plant location and layout; Types of production -job, batch and mass; production Planning and Control: Demand forecasting, routing, scheduling, dispatching and follow up; Break even analysis; Supply chain Management (Definition, Competitive strategy Vs Supply chain Strategy, Supply chain drivers); Project scheduling; Application of CPM and PERT techniques; simple numerical problems;

4.   Materials Management
Materials in industry, Basic inventory control model, ABC Analysis, Safety stock, re-order level, Economic ordering quantity, Stores Management: Stores layout, stores equipment, Stores records, purchasing procedures, e-tendering, e-procurement; purchase records, Bin card, Cardex RFID (Radio Frequency Identification Device)application in materials management;

5.   Maintenance Management & Industrial Safety
Objectives and importance of plant maintenance, Different types of maintenance, Nature of maintenance problems, Range of maintenance activities, Schedules of preventive maintenance, Advantages of preventive maintenance, 5 S principles; Importance of Safety at work places; Causes of accidents-psychological, physiological and other industrial hazards; Domino sequence; methods of promoting safe practices; Pollution control in process industries; Introductory concepts on Solid waste management (General introduction including definitions of solid waste including municipal, hospital and industrial solid waste, Waste reduction at source – municipal and industrial wastes)

6.   Entrepreneurship Development.
Definition of Entrepreneur; Role of Entrepreneur; Concept of Make In India, ZERO defect, Zero Effect, Concept of Start-up Company, Entrepreneurial Development: Role of SSI, MSME, DICs, Entrepreneurial development schemes; Institutional support, financial assistance programmes; Market survey and Demand survey; Preparation of Feasibility study reports

7.   Total Quality Management:

Total Quality Management (TQM)- Concept of quality discussed by B. Crosby W. Edward, Deming, Joseph M. Juran, Kooru Ishikawa, Genichi Taguchi, Shigco Shingo. Quality systems – Definitions of the terms used in quality systems like, quality policy, quality management, quality systems, Stages of development of ISO 9000 series , ISO-14000, Deming's PDCA Cycle (Plan, Do, Check and Action). Japanese Quality Management, culture, Kaizen Strategy (continuous improvement).

8. Smart Technologies :
Overview of IoT - Define IoT, how IoT work, key features of IoT, components of IoT : hardware, software, technology and protocols, advantages and disadvantages of IoT - IoT Applications - Smart Cities, Smart Energy and the Smart Grid, Smart Transportation and Mobility, Smart Home, Smart Buildings and Infrastructure, Smart Factory and Smart Manufacturing, Smart Health, Food and Water Tracking and Security, Participatory Sensing, Social Networks and IoT.

REFERENCE BOOKS

1.   Industrial Engineering and Management -by O.P Khanna
2.   Production Management- by Buffa.
3.   Engineering Economics and Management Science - by Banga & Sharma.
4.   Personnel Management by Flippo.
5.   Production and Operations Management –S.N. Chary
6.   Converging_Technologies_for_Smart_Environments_and_Integrated_Ecosystems_IERC_Book_
         Open_Access_2013 pages-54-76
7.   Supply Chain Management –Sunil Chopra and Meindl, PHI publishers
8   5 S made easy by David Visco

.NET PROGRAMMING WITH C#

Subject Title   :   **.NET PROGRAMMING WITH C#**
Subject Code   :   **IT – 502**
Periods per Week   :   **05**
Periods per Semester   :   **75**

TIME SCHEDULE

S.No	Major Topics	Periods	Weightage Of Marks	Short Answer Questions	Essay Questions
1.	Basics of .NET Framework	8	16	2	1
2.	C# Fundamentals	25	34	3	2½
3.	ADO.NET	18	21	2	1½
4.	Window Applications	14	23	1	2
5.	Web Applications	10	16	2	1
	Total	**75**	**110**	**10**	**8**

Objectives:

On completion of the study of the subject the student should be able to comprehend the following

1   **Basics of .NET Framework.**
1.1   Define .NET Framework.
1.2   List the features of .net framework.
1.3   Draw and explain CLR architecture
1.4   Discuss about frame work class Library .
1.5   Define Microsoft intermediate language
1.6   Discuss Common type system CTS, common type language CTL.
1.7   List .NET languages.
1.8   List the Advantages of .net over C, C++, Java.
1.9   Introduction to C#.NET .
1.10 Describe Integrated development environment in c#.net.
1.11 Describe C#.NET working Environment and browse through menus on the menu bar.
1.12 Explain the help system.
1.13 List the applications of .net.

2   **C# Fundamentals:**
2.1   Analyze variables, constants declarations and their types.
2.2   Discuss various operators.
2.3   Describe classes and objects.
2.4   Discuss user defined data types, scope of variables, life of variables.
2.5   Discuss various type conversions,

2.6 Define array and Develop small projects using Arrays .
2.7 Describe control flow statements like two directional, multi directional flow statements.
2.8 List various loop statements and explain.
2.9 Develop small projects using control flow statements.
2.10 Implement OOPs concepts.
2.11 Discuss recursion concept.
2.12 Explain Exception Handling.
2.13 Analyze debugging and execution.

3   ADO.NET.
3.1 Introduction to ADO.NET
3.2 Discuss data objects.
3.3 Describe how to connect data base to c# application through server explorer.
3.4 Explain the process of Accessing data with data adapters and data sets.
3.5 Explain Multiple Table Connection.
3.6 List the features and advantages with ADO.NET.

4   Window Applications.
4.1 Discuss the designing aspects of C#.NET windows application forms.
4.2 List the steps for creating a windows application
4.3 List various elements of user interface.
4.4 Discuss the properties of controls like text box, label , button, check box, radio button, combo box, list box, data grid.
4.5 Explain the design process of a simple form and display the messages using the above controls.
4.6 List and discuss the common properties of above controls.
4.7 Describe how to enable, disable the controls and run the applications.
4.8 Explain the steps to creation of Menus at design time using the menu design window.
4.9 Develop a project to control menus at run time.
4.10 Explain how to create short cut keys for pull down menus.
4.11 Describe common dialogue control.
4.12 Discuss about fundamentals of graphics controls like line and shape.
4.13 Explain the process of connecting database.
4.14 Describe navigating data source.
4.15 Discuss about Data Grid View,
4.16 Define Data validation.
4.17 Explain about designing and coding simple form.
4.18 Discuss about the deploying and distribution of windows application.

5   Web Applications.
5.1 Introduction to Web Forms.
5.2 Discuss the steps for creating a web application
5.3 Describe the usage of text box, label, button, check box, radio button, drop down list, list box, data grid, hyperlink, images, panel, hidden field.
5.4 Discuss about Data Grid View,
5.5 List and describe various Data validation controls.
5.6 Explain the process of passing data between two web forms.
5.7 Explain the process of designing and coding simple form.
5.8 Explain how to deploy and distribute a web application.

COURSE CONTENTS

1. **Basics of .NET Framework:**
   Introduction to .NET Framework, Features of .net, Common Language Runtime, Framework Class Library, Name space, common type system, common language specification, execution process of . net program, JIT, MSIL, assembly, Garbage Collection, Advantages of .net over C, C++, Java. Understanding Visual Studio IDE. Know about the help system, applications of .net.

1. **C# fundamentals:**
   Introduction to C# , Features, Advantages, data types, value type, reference type, variables, constants, operators, data type conversions, Classes & Objects, interface, Arrays & Collections , oops features, conditional statements, iterative statements, exception handling, writing C# console program, debugging and executing program.

2. **ADO.NET :**
   Overview of ADO.NET model , Data objects : Connection Object, Command Object, Data Readers, Data Sets & Data Adapters , working with MS-Acess and Oracle Database. Features and Advantages of ADO.NET

3. **Window Applications:**
   Steps for creating a window application, working with various controls- text box, label , button, check box, radio button, combo box, list box, data grid, common dialog controls, creating and working with menus, distributing the windows application, database connecting, fundamentals of graphics and Graphic controls, simple designing and coding**.**

4. **Web Applications:**
   Steps for creating a web application, working with various controls- text box, label , button, check box, radio button, drop down list, list box, data grid, hyperlink, images, panel, hidden field, data validation controls, passing data between two web forms, deploying and distributing a web application.

REFERENCE BOOKS:

1. Programming in C#: A Primer",Balaguruswamy, McGraw-Hill.
2. C# A Beginner's Guide",Herbert Schildt, McGraw-Hill.
3. Learning C#",Jesse Liberty and Brian MacDonald, O'Reilly
4. Pro C# and the .NET Framework",Andrew Troelsen, Apress
5. Mastering Visual C# .NET",Jason Price & Mike Gunderloy, Publisher: Wiley

OOP THROUGH JAVA

Subject Title	:	OOP through Java
Subject Code	:	IT - 503
Periods per Week	:	05
Periods per Semester	:	75

TIME SCHEDULE

S. No.	Major Topic	No. of periods	Weigtage of marks	Short Answer Questions	Essay Questions
1	Object oriented programming concepts	10	13	1	1
2	Java basics, usage of classes and objects	18	29	3	2
3	Inheritance, Packages and Interfaces	18	29	3	2
4	Multithreaded Programming and Exception Handling	17	26	2	2
5	Data access using JDBC	12	13	1	1
	Total	**75**	**110**	**10**	**8**

OBJECTIVES

On completion of the study of the course the student shall be able to:

1   Object oriented programming concepts.
  1.1 Know about object oriented programming
  1.2 Compare procedure oriented programming and object oriented programming
  1.3 List and explain features of object oriented programming
  1.4 Define class and object
  1.5 Compare class and structure

2.0   Know Java basics, usage of classes and objects.

2.1   Explain the history and features of Java
2.2   Understand byte code of Java and JVM
2.3   Understand the process of entering and executing a Java program
2.4   Know about comment and key words in Java
2.5   Know about Unicode and naming system in Java
2.6   List and explain basic data types of Java.
2.7   Explain Java literals.
2.8   Declare and initialize variables.
2.9   Perform type conversion and casting features.
2.10   Use one-dimensional and two–dimensional array.
2.11   Explain various types of operators.
2.12   Write the syntax of selection statements of Java.
2.13   Write the syntax of iteration statements of Java.
2.14   Write the syntax of jump, break, and continue statements.
2.15   Create classes and objects.
2.16   Use new operator and methods.
2.17   List and explain various types of constructors.
2.18   Explain method overloading.
2.19   Use of 'this' pointer.
2.20   Explain the working of static and final.
2.21   Explain string classes and methods.
2.22   Use command-line arguments.

3.0   Know the concepts of inheritance, package and interfaces.

3.1   List the types of inheritance.
3.2   Implement inheritance
3.3   Create multi level hierarchy.
3.4   Use 'final' to avoid overriding.
3.5   Define a package.
3.6   Describe the concept of class path.
3.7   Describe the concept of Access protection.
3.8   Use a class from another class.
3.9   Appreciate the concept of importing packages.
3.10   Explain the concept of Interfaces.
3.11   Define an Interface.
3.12   Write the difference between class and interface.
3.13   Implement interfaces.
3.14   Explain the scope of variables in interfaces.

4.0   Know multi threaded programming and exception handling.

4.1   Explain the thread model of Java.
4.2   Explain thread priorities.
4.3   Explain the concept of synchronization.
4.4   Create thread using Thread class.
4.5   Create thread using Runnable interface
4.6   Create multiple threads.
4.7   Describe alive ( ), join ( ), suspend( ), resume( ) methods.
4.8   Explain Inter thread communication.
4.9   Explain deadlock.
4.10   Explain the sources of errors.
4.11   Write the advantages of exception handling.

4.12 Explain how to deal with exceptions.
4.13 Explain the concept of multi-catch statements programs.
4.14 Explain the types of exceptions.

5.0   Data access using JDBC

5.1 Know about JDBC
5.2 Understand JDBC Architecture
5.3 Know about Connection interface and DriverManager class
5.4 List and know about JDBC drivers
5.5 Know about 3 kinds of Statements: Statement, Prepared Statement and Callable
    Statement
5.6 Understand the steps in connecting to database using JDBC:
        a. Know how to establish a connection
        b. Create a statement
        c. Execute the query
        d. Process the ResultSet object
        e. Close the connection.
5.7 Example programs using JDBC

COURSE CONTENTS

1.   **Object oriented programming concepts**: Procedure oriented programming and object
      oriented programming, OOP features, class and comparison of object, structures

2.   **Java basics, usage of classes and objects:** History of Java – Java applets –
      Applications – Byte codes-literals – comments writing – key words – separators. Data
      types – declaring variable – scope – life time type conversions – casting – Arrays.
      Operators: Types of operators – order of precedence of operators – selection
      statements – control statements – jumping statement – break, continue statements,
      Usage of classes – objects – new – methods – constructors – method overloading, string
      classes – command line arguments..

3.   **Inheritance, Packages and Interfaces:** inheritance super class, sub classes – types of
      inheritance - Multi level hierarchy – overriding – Concept of packages and Interfaces –
      importing of packages – implementing Interfaces.

4.   **Multi threading and Exception Handling:** Define thread – life cycle of thread - Multi
      threading - Inter thread communication – Dead locks – Thread properties – Exception
      handling: Source of errors – error handling – avoiding, handling.

5.   **Data access using JDBC:** JDBC – JDBC Architecture – Classes, interfaces and drivers
      related to JDBC – Connecting to database using JDBC

REFERENCE BOOKS

1. The complete reference Java   --   Pattrick Naughten, Herbert Schildt

TMH company Limited, New Delhi.

2. Programming in JAVA   --   P. Radhakrishna, University Press

3. Programming in Java   --   Muthu   - Thomson

4. Java Foundations of Programming   –   NIIT, PHI

5. Programming with Java   --   Balagurusamy, TM

Mobile Application Development

Subject Title   **:**   **Mobile Application Development**

S. No.	Major Topic	No. of periods	Weightage of marks	Short answer questions	Essay questions
1	Introduction to mobile application development	5	3	1	0
2	Smart phone hardware architecture	15	26	2	2
3	Different mobile operating system	15	26	2	2
4	Programming components of Android	20	29	3	2
5	Develop Android applications using UI controls	20	26	2	2
	Total	**75**	**110**	**10**	**8**

Subject Code : **IT - 504**
Periods per Week : **05**
Periods per Semester : **75**

TIME SCHEDULE

OBJECTIVES

On completion of the study of the course the student shall be able to:

1.0   Learn the basics of mobile application development

  1.1   Define mobile device
  1.2   List the different type of mobile devices
  1.3   Define mobile application development
  1.4   Classify mobile application development : native, web and hybrid

2.0   Understand smart phone hardware architecture

  2.1   Define smart phone
  2.2   Discuss the evolution of smart phones
  2.3   List the key features of smart phone.
  2.4   Define System on Chip (SoC)
  2.5   List and briefly explain the components of SoC
  2.6   List the advantages and disadvantages of SoC
  2.7   Briefly discuss the features of processor architectures – Traditional DSP Architecture, Modern DSP Architecture, SoC based architecture
  2.8   List the contemporary processors

COURSE CONTENT

1. **Basics of mobile application development**
   Define a mobile device - different type of mobile devices - Define mobile application development – different types of mobile application development : native, web and hybrid.

2. **Smart phone hardware architecture**
   Define smart phone - The evolution of smart phones - Key features of smart phone - Define System on Chip (SoC) – The components of SoC - Advantages and disadvantages of SoC - Features of processor architectures – Traditional DSP Architecture, Modern DSP Architecture, SoC based architecture - The contemporary processors - Different peripheral devices in a smart phone - Future technology.

3. **Different mobile operating system**
   Mobile operating system - different mobile operating systems - State in brief the history of iOS - Block diagram of iOS Architecture - Layers in iOS architecture - Features of different layers of iOS. History of Android OS - Block diagram of Android OS Architecture - Layers in Android OS architecture - Features of different layers of Android OS - Compare iOS and Android OS.

4. **The programming components of Android**
   The different versions of Android - The programming languages used for developing Android applications. - Android Environment Setup using Android Studio IDE - The Android Environment Setup using Eclipse IDE - The Programming Components of Android – Activities, Services, Content Providers, Broadcast Receivers, Android Activating component: Intent, Calling a Number, Switching between Activities - The procedure to create "Hello world!" app - The Creation of Android new application - The Anatomy of Android application - Main Activity file, Manifest file, R file, Strings file, The layout file, Running the Android application - The usage of Toast message.

5. **Develop Android applications using UI controls**
   The lifecycle of Android Activities - Activity Callback functions - User Interface Designing Layouts - Relative Layout, Linear Layout, List View Layout, Grid view Layout - The usage of User Interface Controls – Textbox, Edit Text, Button, Checkbox, Radio Button, Toggle button, Spinner, Date picker, Time picker - Develop an Android application that switches between Activities - Develop simple Android applications using UI controls.

REFERENCES

1. Today's Smartphone Architecture by Malik Wallace and Rafael Calderon - *meseec.ce.rit.edu/551-projects/spring2016/2-6.pdf*
2. *https://cs4720.cs.virginia.edu/slides/CS4720-MAD-iOSAppComponents.pdf*
3. http://www.javatpoint.com/android-tutorial

ADVANCES IN INFORMATION TECHNOLOGY

Subject Title : **Advances in Information Technology**
Subject Code : **IT - 505**
Periods per Week : **06**
Periods per Semester : **90**

TIME SCHEDULE

S. No.	Major Topic	No. of periods	Weightage of marks	Short answer questions	Essay questions
1	Software Engineering	15	13	1	1
2	Cloud Computing	20	26	2	2
3	Data Mining	20	26	2	2
4	Big Data	15	16	2	1
5	Unified Modeling Language	20	29	3	2
	Total	**90**	**110**	**10**	**8**

1.0   Understand the basics of Software Engineering & Life Cycle Models

    1.1   Know the Evolution and Impact of the Software Engineering
          1.1.1 Evolution of an Art to an Engineering Discipline
          1.1.2 A Solution to the Software Crisis?
    1.2   Know the difference between Programs and Software Products
    1.3   Explain the Software Life Cycle Models
          1.3.1 Classical Waterfall Model
          1.3.2 Iterative Water fall Model
          1.3.3 Prototyping Model
          1.3.4 Evolutionary Model
          1.3.5 Spiral Model
          1.3.6 Comparison of Different Life Cycle Models

2.0   Understand the basics of Cloud Computing:
    2.1   Define the following terms related to recent trends in Computing
            2.1.1   Cluster Computing
            2.1.2   Grid Computing
            2.1.3   Distributed Computing
            2.1.4   Utility Computing
    2.2   Define Cloud Computing
    2.3   State the history of Cloud Computing
    2.4   List the features of Cloud Computing
    2.5   State the basic principles of Cloud Computing
    2.6   List the challenges of Cloud Computing
    2.7   List the Cloud Service Providers
    2.8   State the advantages and disadvantages of Cloud Computing
    2.9   Compare Cluster Computing, Grid Computing, Distributed Computing, Utility
            Computing and Cloud Computing

3.0 Understand the basics of Data Mining
   3.1   Define data mining.
   3.2   Explain Data Mining – On what kind of data.
   3.3   Explain The following Data Mining functionalities.
      3.3.1   Concept/ Class description : Characterization and discrimination.
      3.3.2   Mining frequent patterns, Associations and correlations.
      3.3.3   Classification and prediction.
      3.3.4   Cluster Analysis.
      3.3.5   Describe Outlier Analysis.
      3.3.6   Evolution Analysis.

4.0 . Understand Big Data concepts

   4.1 Define big data
   4.2 Evolution of data/big data
   4.3 List the characteristics of big data – the three V's of big data
   4.4 Storing Big Data
   4.5 Selecting Big Data
   4.6 Processing Big Data
   4.7 Classify the structures of Big Data
   4.8 Need of Big Data
   4.9 List the sources of big data
   4.10   Define Big Data Analytics
   4.11   List the types of tools used in Big Data
   4.12   List and explain the applications of big data
   4.13   List the risks of Big Data

5.0 Understand the concepts of the Unified Modeling Language (UML)

   5.1.   List the goals of UML
   5.2.   Know the role of UML in Object oriented Design
   5.3.   List the building blocks of UML : Things, Relationships, and Diagrams
   5.4.   Explain the UML building blocks
   5.5.   Know the different symbols used in UML notation
   5.6.   Classify and list standard UML diagrams
   5.7.   Class diagram
      5.7.1.   Know the purposes of class diagram
      5.7.2.   Learn to draw the class diagram
   5.8.   Use case diagram
      5.8.1.   Define the term Use case
      5.8.2.   Know the purposes of Use case diagram
      5.8.3.   Learn to draw the Use case diagram
   5.9.   Interaction diagram
      5.9.1.   Know the purposes of Interaction diagram
      5.9.2.   List the types of interaction diagrams : Sequence diagram and Collaboration
            diagram
      5.9.3.   Learn to draw the Interaction diagrams

COURSE CONTENT

1.0   Understand the basics of Software Engineering & Life Cycle Models

The Evolution and Impact of the Software Engineering - Evolution of an Art to an Engineering Discipline - A Solution to the Software Crisis - difference between Programs and   Software Products -   Software Life Cycle Models - Classical Waterfall Model - Iterative Water fall Model - Prototyping Model - Evolutionary Model - Spiral Model - Comparison of Different Life Cycle Models

2.0   Understand the basics of Cloud Computing

Recent Trends in Computing, History of Cloud Computing, Features, Principles and Challenges of Cloud Computing, Cloud Service Providers Advantages and Disadvantages of Cloud Computing, Compare Cluster Computing, Grid Computing, Distributed Computing, Utility Computing and Cloud Computing

3.0   Understand the basics of Data Mining

What is data mining, Data Mining – On what kind of data, Data Mining functionalities, Concept/ Class description : Characterization and discrimination, Mining frequent patterns, Associations and correlations, Classification and prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis.

4.0 .   Understand Big Data concepts

Define big data - Evolution of data/big data - Characteristics of big data – the three V's of big data - Storing Big Data - Selecting Big Data - Processing Big Data - Classify the structures of Big Data - Need of Big Data - List the sources of big data - Define Big Data Analytics - Types of tools used in Big Data - Applications of big data - Risks of Big Data.

5.0   Study the concepts of the Unified Modeling Language

Goals of UML - Role of UML in Object oriented Design - Building blocks of UML : Things, Relationships, and Diagrams - Symbols used in UML notation - Classify and list standard UML diagrams - Class diagram, purposes of class diagram, draw the class diagram - Use case diagram, define the term Use case, purposes of Use case diagram, draw the Use case diagram - Interaction diagram, purposes of Interaction diagram, the types of interaction diagrams : Sequence diagram and Collaboration diagram, draw the Interaction diagrams.

REFERENCE BOOKS

1. Fundamentals of Software Engineering – Rajib Mall (PHI) Second Edition
2. Cloud Computing : Principles and Paradigms – Rajkumar Buyya, James Broberg and Andrzej Goscinski
3. Mastering Cloud Computing – Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi
4. Data Mining: Concepts and Techniques, Jiawei Han, Micheline Kamber
5. Big Data Basics part1 and 2 in www.mssqltips.com
6. UML Reference http://www.tutorialspoint.com/uml/

JAVA PROGRAMMING LAB

Subject Title : **Java Programming lab**
Subject Code : **IT – 506**
Periods per Week : **04**
Periods per Semester : **60**

List of Exercises

1. Write programs using Java built-in functions using all data types.

2. Write programs using conditional statements and loop statements.

3. Write a program to read data from keyboard.

4. Write a program to create class and objects.

5. Write programs using constructors.

6. Write a program to illustrate usage of command line arguments.

7. Write programs using concept of overloading methods.

8. Exercise on inheritance.

9. Write a program using the concept of method overriding.

10. Exercise on importing packages.

11. Exercise on interfaces.

12. Exercise on exception handling.

13. Exercise on multithreading and thread priorities.

14. Exercise on database connectivity using JDBC.

15. Familiarization with Rational Rose or Umbrello

16. Take any case study and Draw the use case Diagram, Class Diagram, Interaction diagram

Objectives and key competencies.

Exp .No.	Name of the experiment	Objectives	Key Competencies
1	Write programs using Java built-in functions using all data types.	(a) Write programs using the primitive data types. (b) Display the data.	(a) Identify the data types. (b) Use println() method. (c) Compile the program. (d) Rectify the errors. (e) Observe the output.
2	Write programs using conditional statements and loop statements.	(a) Write program using if statement. (b) Write program using while, do and for constructs.	(a) Identify the differences between C, C++ and Java. (b) Compile the program and rectify the errors. (c) Observe the output.
3	Write a program to read data from keyboard.	(a) Write a program to give values to variables interactively through the keyboard. (b) Write program using different data types.	(a) Use different data types. (b) Use readLine() method. (c) Use println() method. (d) Observe the output.
4	Write a program to create class and objects.	(a) Write a program to create a class and create objects. (b) Write a program to create class and access class members.	(a) Create class. (b) Declare methods. (c) Create objects. (d) Write main method. (e) Access class members.
5	Write programs using constructors.	(a) Write a program using default constructor. (b) Write a program using parameterized constructor.	(a) Declare and define constructor. (b) Call default constructor. (c) Call parameterized constructor.
6	Write a program to illustrate usage of command line arguments.	Write a program to illustrate usage of command line arguments.	(a) Use command line arguments. (b) Run the program. (c) Observe the output.
7	Write programs using concept of overloading methods.	(a) Write a program to illustrate method overloading. (b) Write a program to illustrate method overloading using constructors.	(a) Observe method overloading. (b) Overload constructor methods.
8	Exercise on inheritance.	Write a program to illustrate single inheritance.	(a) Create base class. (b) Write base class constructor. (c) Create derived class. (d) Use *extends* keyword. (e) Use *super* keyword. (f) Write derived class constructor.
9	Write a program using the concept of method overriding.	Write a program using the concept of method overriding.	(a) Use method overriding. (b) Use *this* keyword.

10	Exercise on importing packages.	Write a program to create and use a package.	(a) Create package. (b) Use of access specifiers. (b) Use package. (c) Use *import* keyword.
11	Exercise on interfaces.	Write a program to illustrate multiple inheritance using interfaces.	(a) Define interface. (b) Use *extends* keyword. (c) Use *implements* keyword. (d) Access interface variables.
12	Exercise on exception handling	(a) Write a program to illustrate exception handling. (b) Write a program to illustrate exception handling using multiple catch statements.	(a) Use try – catch. (b) Use multiple catch blocks. (c) Use finally statement.
13	Exercise on multithreading and thread priorities.	(a) Write a program to create a thread by extending the thread class. (b) Write a program to create a thread by implementing the runnable interface. (c) Write a program to illustrate thread priorities.	(a) Use *extends, new*. (b) Use run() and start() methods. (c) Observe thread execution. (d) Use *implements runnable* interface. (e) Use setPriority() and getPriority() methods.
14	Exercise on database connectivity using JDBC.	Write a program to connect to MS-Access Database using JDBC.	(a) Connect to the DB (b) Apply the query (c) Get the Resultset (d) Show the results
15	Familiarization with Rational Rose or Umbrello	Familiarization with any one software like Rational Rose or Umbrello.	(a) Study the Tool Box (b) Study various Menu (c) Study how to draw various diagrams.
16	Take any case study and Draw the use case Diagram, Class Diagram, Interaction diagram	Student may take any case study and draw the UML diagrams from the case study	A) Know how to draw Use case diagrams B) Know how to draw class diagrams C) Know how to draw Interaction Diagram.

.NET PROGRAMMING LAB

Subject Title   :   .NET Programming Lab

Subject Code   :   IT – 507

Periods per Week   :   06

Periods per Semester :   90

LIST OF EXCERCISES using C# :

1. Exercise on all basic controls in designing forms.

2. Design a calculator using appropriate commands.

3. Exercise on menus at design time and run time.

4. Exercise on modifying and deleting menu items.

5. Develop a project using arrays and control statements.

6. Develop a project using recursive concept.

7. Exercise on Line and Shape Controls.

8. Exercise on console application which accept two argument from the user and
   returns four output values as sum, difference, product and quotient of those two
   arguments.

9. Develop a calculator windows application.

10. Exercise on web forms using appropriate control elements.

11. Design a student details web form.

12. Exercise on web forms using images , hyperlinks.

13. Exercise on data accessing in ADO.NET with multiple tables.

14. Develop a student web application, connect to database.

    a) Retrieve student details and display in web form.

    b) Retrieve student marks, calculate percentage display the result in tabular form.

.NET Programming Lab		
Name of the Experiment	Objectives	Key Competencies
Exercises on designing forms	Learning forms of i. .NET Framework ii. Visual Studio IDE iii. Help System	❖ Study the creation of forms ❖ Validate whether the memory allocation ❖ Study the basics of IDE and help system ❖ Familiar with Framework.
Exercises on menu items	Write procedure for i. Creation of Menus ii. Managing Menus	❖ Validate whether the memory allocation is done ❖ Study of Menu items ❖ Analysis of menus at designing time and run time
Exercises on C# Programming, Graphical controls Web forms ADO.NET	Write a program for i. Using C# control statements ii. Graphical controls iii. Web Forms iv. ADO.NET	❖ Analysis of Memory availability ❖ Study the syntax of C# programming commands and control statements. ❖ Study the concepts of various line and shape controls ❖ Study creating and executing console applications. ❖ Study data accessing in ADO.NET with multiple tables. ❖ Familiar in developing websites using web forms, images and hyperlinks. ❖ Learning data base connection to the .net application. ❖ Case study on student details.

LIFE SKILLS

Subject Title   :   **Life Skills**
Subject Code   :   **IT-508**
Periods/ Week   :   **03**
Periods/Semester   :   **45**

TIME SCHEDULE

SI No.	UNITS	No. of periods Allotted		
		Explanation	Activities	Total
1.	ATTITUDE	1	3	4
2.	ADAPTABILITY	1	3	4
3.	GOAL SETTING	1	3	4
4.	MOTIVATION	1	3	4
5.	TIME MANAGEMENT	1	3	4
6.	CRITICAL THINKING	2	3	5
7.	CREATIVITY	1	3	4
8.	PROBLEM SOLVING	1	3	4
9.	TEAM WORK	1	3	4
10.	LEADERSHIP	1	3	4
11.	STRESS MANAGEMENT	1	3	4
	TOTAL	12	33	45

Note: No Written Examination; The total 45 hours are to be considered as Theory hours.

Marks: Internal – 40;   External – 60

OBJECTIVES:

Upon the completion of this course, the student shall be able to

1.0   Understand the concept of Attitude

    1.1   Define 'Attitude'

    1.2   Explain the importance of Attitude

    1.3   Distinguish between Positive and Negative Attitudes

    1.4   Life Response: Need for change of Attitude

    1.5   Positive Attitude: Key to success in Personal and Professional Lives

2.0   Understand the concept of Adaptability

    2.1   Define the term 'Adaptability'

    2.2   Explain the concept of Adaptability

    2.3   Advantages of Adaptability

    2.4   Disadvantages of Lack of Adaptability

    2.5   Need for positive response to change

3.0   Understand the concept of Goal setting

    3.1   Define the terms 'Goal' and 'Goal Setting'

    3.2   Explain the significance of Goal setting & Long and Short term goals

    3.3   Explain the following concepts

        a) Wish   b) Dream c) Goal

    3.4   Explain the reasons for and consequences of not setting goals

    3.5   The SMART features in Goal setting

4.0   Understand the concept of Motivation

    4.1   Define 'Motivation' ;   Inspiration Vs Motivation

    4.2   Importance of motivation in Goal setting

4.3   Distinguish between Internal (Self) Motivation and External Motivation

4.4   De-motivating Factors and how to overcome them

4.5   Motivating oneself and others

5.0   Understand Time Management skills

5.1   Define 'Time Management'.

5.2   Comprehend the significance of Time Management.

5.3   Explain the Time Quadrant

5.4   Common Time wasters and how to overcome them.

5.5   How to meet deadlines and targets within time

6.0   Understand Critical Thinking

6.1 Define "Critical Thinking",

6.2 Understand the importance of Critical Thinking

6.3 Distinguish between facts and opinions (assumptions)

6.4 Inculcating different perspectives

6.5 Developing Reasoning abilities and form sound judgments

7.0   Understand Creativity

7.1 Understand the importance of and need for creative ideas

7.2 Distinguish between Linear Thinking and Lateral Thinking

7.3 Distinctive qualities of creative people

7.4 Unusual or creative use of familiar objects

7.5 Creative ways of solving problems

8.0   Understand Problem Solving

8.1. Define the concept of Problem solving

8.2 Viewing the problems as challenges

8.3 Different steps in solving a problem

8.4 Selecting the best solution to solve a problem

8.5 Lateral thinking in Problem solving

9.0   Understand Team Work

9.1 Define Team work

9.2 Develop Team skills

9.3 Advantages of team work

9.4 Understand responsibilities as a team player

9.5 Problems of working in a team and possible solutions

10. 0   Understand Leadership

10.1 Define Leadership

10.2 Identify Leadership qualities

10.3 Analyze one's strengths and limitations as a leader

10.4 Types of Leadership: Autocratic and Democratic

10.5 Leadership by example

11.0   Understand Stress Management

11.1 Define Stress

11.2 Explain the causes of stress

11.3   Learn Stress Management skills

11.4 Need for positive thinking and self esteem

11.5 Practice Stress Management strategies

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MOBILE APPLICATION DEVELOPMENT LAB

Subject Title   : Mobile Application Development Lab
Subject Code   : IT– 509
Periods per Week   : 03
Periods per Semester : 45

List of Excercises

1. Exercise on Android Environment Setup using Android Studio IDE
2. Exercise on Android Environment Setup using Eclipse IDE
3. Create a new Android project to display 'Hello Wolrd'
4. Create a Android app to show a Toast message
5. Create an Android app to illustrate the use of Button control
6. Create an Android app to accept two numbers in two EditText (textfields) and display the sum of them in a Toast message on clicking a button
7. Create an Android app to accept a number in EditText and display the factorial of it in a Toast message on clicking a button
8. Create an Android app to illustrate the use of CheckBox widget.
9. Create an Android app to illustrate the use of Spinner(ComboBox) widget.
10. Create an Android app to illustrate the use of Datepicker widget.
11. Create an Android app to illustrate the use of Timepicker widget.
12. Create an Android app that uses multiple UI controls like EditText, CheckBox, Spinner and Buttons
13. Create an Android app to shift from one activity to another activity using a button.

Mobile Application Development Lab Objectives and Key Competencies

Sl.No	Name of the Experiment	Objectives	Key Competencies
1	Exercise on Android Environment Setup using Android Studio IDE	Install the Android SDK and Android Studio IDE	❖ Confirm whether Android SDK is installed with the required versions ❖ Confirm whether Android Studio is installed with the required components and Emulator
2	Exercise on Android Environment Setup using Eclipse IDE	Install the Android SDK and Eclipse IDE	❖ Confirm whether Android SDK is installed with the required versions ❖ Confirm whether Eclipse IDE is installed with the required components and Emulator
3	Exercise to create a new Android project to display 'Hello World'	Create a new project in Android Studio/Eclipse IDE with	❖ Create a new project in Android IDE
4	Exercise to show a Toast message	Create a Android app to show a Toast message	❖ Correct syntactical errors ❖ Debug logical errors ❖ Study the Toast class and its required methods
5	Exercise to illustrate the use of button control	Create an Android app to illustrate the use of button control	❖ Correct syntactical errors ❖ Debug logical errors ❖ Study the Button classes and the required methods ❖ Confirm whether the result shown in the Toast
6	Exercise to create an Android app to accept two numbers in textfields and display the sum of them in a Toast message on clicking a button	Create an Android app to accept two numbers in textfields and display the sum of them in a Toast message on clicking a button	❖ Correct syntactical errors ❖ Debug logical errors ❖ Study the EditText and Button classes and the required methods ❖ Confirm whether the addition is performed and shown in the Toast
7	Exercise to create an Android app to accept a number in textfield and display the factorial of it in a Toast message on	Create an Android app to accept a number in textfield and display the factorial of it in a Toast message on clicking a button	❖ Correct syntactical errors ❖ Debug logical errors ❖ Study the EditText and Button classes and the required methods ❖ Confirm whether the factorial is computed and shown in the Toast

Mobile Application Development Lab Objectives and Key Competencies			
Sl.No	Name of the Experiment	Objectives	Key Competencies
	clicking a button		
8	Exercise on Checkbox control	Create an Android app to illustrate the use of checkbox control	❖ Correct syntactical errors ❖ Debug logical errors ❖ Study the Checkbox class and its required methods ❖ Confirm whether the selected checkbox value is shown on a Toast
9	Exercise on Spinner (ComboBox) Control	Create an Android app to illustrate the use of Spinner(ComboBox) control	❖ Correct syntactical errors ❖ Debug logical errors ❖ Study the Spinner class and its required methods ❖ Confirm whether the selected Spinner value is shown on a Toast
10	Exercise on Datepicker	Create an Android app to illustrate the use of Datepicker widget.	❖ Correct syntactical errors ❖ Debug logical errors ❖ Study the Datepicker class and its required methods ❖ Confirm whether the selected date value is shown on a Toast
11	Exercise on Timepicker	Create an Android app to illustrate the use of Timepicker widget.	❖ Correct syntactical errors ❖ Debug logical errors ❖ Study the Timepicker class and its required methods ❖ Confirm whether the selected time value is shown on a Toast
12	Exercise on multiple UI controls	Create an Android app that uses multiple UI controls like textfield, Checkbox, Spinner and Buttons	❖ Correct syntactical errors ❖ Debug logical errors ❖ Confirm whether the required operations are done properly
13	Exercise on Intent	Create an Android app to shift from one activity to another activity using a button.	❖ Correct syntactical errors ❖ Debug logical errors ❖ Know how to apply startActivity() method using intent ❖ Confirm whether the control moves from one activity to another activity.

VI SEMESTER

DIPLOMA IN INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTIONS AND EXAMINATION

C-16-VI SEMESTER
IT - 601 INDUSTRIAL TRAINING

S.NO	Subject	Duration	Items	Max Marks	Remarks
1	Practical Training in the Industry	6 Months	1.First Assessment (at the end of 3rd month)	100	
			2. Second Assessment (at the end of 6th month)	100	
			3.Training Report a)Log Book b)Record	30 30	
			4. Seminar	40	
TOTAL		**300**			

The industrial training shall carry **300** marks and pass marks are **50**%.A candidate failing to secure the minimum marks should complete it at his own expenses. No apprenticeship training stipend is payable in such case

During Industrial training the candidate shall put in a minimum of **90%**attendance

Duration : 6 months

OBJECTIVES

On completion of a spell of practical training in a industry, the student will be able to

1.0   Know organizational set up

    1.1   Know the function of each department/section

    1.2   Know the inter relationship among various

        department/sections

2.0   Know the various Computer Components and its related software.

    2.1   Understand the working of Computer Systems.

    2.2   Know the Installations and Uninstallations of various hardware components and software concerned.

    3.0 Understand the various stages involved in processing, sequential arrangement of

different equipment.

    3.1   Draw the flow diagram, detail flow diagram of each process
    3.2   Understand the arrangement of various equipment and machinery in systematic manner in a less possible area of site.

4.0   Know the Development of algorithm and Programming Methodology

5.0   Know the trouble shooting of various peripherals

    5.1   Know preventive precautions of each equipment in the System

    5.2   Startup and shut down procedures for the equipment.

    5.3   Understand the virus management of the Systems.

6.0   Know the various techniques of DBMS

7.0   Know the various networking Methods.

8.0   Know System Administration of Servers

INDUSTRIAL TRAINING SCHEME

VI SEMESTER

1. A candidate shall be assessed twice in the spell of industrial training i.e. at the end of third month and finally before he/she completes the industrial training

2. The assessment shall be carried out by a committee comprising of

    (a) A representative of the Industry where the candidate is undergoing training

    (b) A staff member of the concerned section of the polytechnic.

3. The assessment at the end of the third month and the end of training shall each carry 100 marks for the progress made during the corresponding period of training.

4. The remaining 100 marks are allotted as follows:

    For the training report (Record) 30 marks,
    For maintenance of log book 30 marks
    For seminar 40 marks.
    These are to be evaluated at the institution at the end of training by a committee consisting following staff members
    (1) Head of Section.
    (2) External Examiner preferably from Industry
    (3) Staff member who assessed the student during the Industrial Training.

5. The progress made during the end of assessment will be evaluated on the basis of the following parameters.

ASSESSMENT SCHEME

ASSESSMENT SCHEMES. No.	Name of the Parameter	Max. Marks Allotted for each Parameter
1.	Attendance and punctuality	5
2.	Familiarity with Technical terms	5
3.	Familiarity with Technologies	10
4.	Attitude towards job	10
5.	Application of knowledge	15
6.	Problem solving skills	10
7.	Comprehension and observation	10
8.	Human relations	10
9.	Ability to communicate	10
10.	General conduct during the period	5
11.	Maintenance of dairy	10
	Total:	**100**