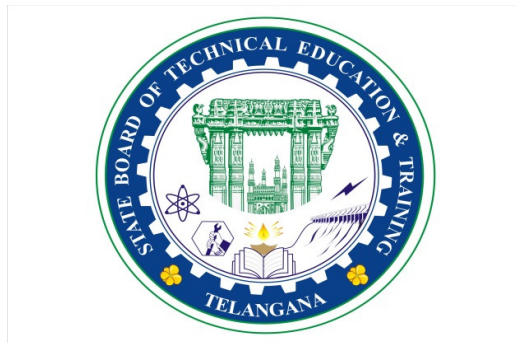


**DRAFT CURRICULUM – 2016
(C-16)**

**DIPLOMA IN
COMPUTER ENGINEERING**



**State Board of Technical Education & Training
Telangana State
HYDERABAD**

CURRICULUM (C-16)

FOR DIPLOMA COURSES IN TELANGANA

I. PREAMBLE

The State Board of Technical Education and Training, **Telangana** under the aegis of the Department of Technical Education, Telangana generally reviews the Curricula to tune up the updated development both in academic and industry side. However, recognizing the changing needs as stated by the user industries, the Board has decided to bring forward the revision of curriculum. Consequently the Board with the assistance of senior faculty the concerned branches performed the evaluation of C-14 Curriculum in force. On finding the merits and demerits of C-14 Curriculum the faculty have made a thorough assessment of the curricular changes that have to be brought in. It was felt that there is an urgent need to improve hands-on experience among the students pursuing diploma courses. Further, the urgency of enhancing communication skills in English was also highlighted in the feedback and suggestions made by the user industries. Keeping these in view, a number of meetings and deliberations were held at state level, with experts from industry, academia and senior faculty of the department. 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 Telangana, 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 or C-16 is planned and designed duly introducing 6 months industrial training in 3rd year level (5th or 6th semester) to have good exposure with industries and it will be implemented from the academic year 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. 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.
4. 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 in III and IV semesters respectively for all the branches.
5. 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.
6. CAD specific to the branch has been given more emphasis in the curriculum. Preparing drawings using CAD software has been given more importance.
7. 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.
8. The number of teaching hours allotted to a particular topic/chapter has been rationalized keeping in view

the past experience

9. Upon reviewing the existing C-14 curriculum, more emphasis is given to the practical content of Laboratories and Workshops, thus strengthening the practical skills.
10. 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. While the course content in certain subjects is reduced, in rest of the subjects the content has been enhanced as per the need.
11. All Practical subjects are independent of each other and the practice of grouping two or more practical subjects is dispensed with.
12. 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.
13. The Members of the working group are grateful to Dr.M.V.Reddy, I.A.S., Director of Technical Education & Chairman, S.B.T.E.T. for his constant guidance and valuable inputs in revising, modifying and updating the curriculum.
14. The Members acknowledge with thanks the cooperation and guidance provided by the Sri. D. Venkateswarlu, Secretary, SBTET, Telangana and other officials of Directorate of Technical Education and the State Board of Technical Education, Telangana, experts from industry, academia from the universities and higher learning institutions and all teaching fraternity from the Polytechnics who are directly and indirectly involved in preparation of the curricula.

II. RULES AND REGULATIONS

1. ADMISSION PROCEDURES:

1.1 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, the training will be in the seventh semester.

1.2 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.

- i) 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, Telangana, Hyderabad.

Only the candidates satisfying the following requirements will be eligible to appear for the Common Entrance Test for admissions into Polytechnics (POLYCET).

- a) The candidates seeking admission should have appeared for the X class examination, conducted by the Board of Secondary Examination, Telangana or equivalent examination thereto, at the time of making application to the Common Entrance Test for Polytechnics for admissions into Polytechnics (POLYCET). In case of candidates who apply pending results of their qualifying examinations, their selection shall be subject to production of proof of their passing the qualifying examination in one attempt or compartmentally at the time of interview for admission.

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

13 MEDIUM OF INSTRUCTION

The medium of instruction and examination shall be English.

14 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 candidate so as to facilitate this work and avoid errors in tabulation of results.

15 NUMBER OF WORKING DAYS PER SEMESTER / YEAR:

- a). The Academic year for all the Courses usually shall be from June 2nd week of the year of admission to the 31st March of the succeeding year.
- 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.

16 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). Candidates having less than 65% attendance shall be detained.
- d). Students whose shortage of attendance is not condoned in any semester / 1st year 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.
- e). A stipulated fee shall be payable towards condonation for shortage of attendance.

17 READMISSION

Readmission shall be granted to eligible candidates by the respective RJD / Principal.

- 1) Within 15 days after commencement of class work in any semester (Except industrial Training).
- 2) Within 30 days after commencement of class work 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.

2 SCHEME OF EXAMINATION

21 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 and VI Semesters:

THEORY EXAMINATION: Each subject carries usually 80 marks and 40 marks in respect of specified subjects of 3 hours duration, along with 20/ 10 marks for internal evaluation (sessional marks) respectively.

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

22 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) Practicals: Student's performance in Laboratories / Workshop shall be assessed during the year 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 seriatim.
- c) Internal assessment in Labs / workshops / Survey field 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 maybe.
- 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 the department preferably choosing a person from an Industry. 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) **Evaluation and assessment of industrial training**, shall be done and marks be awarded in the following manner.

Industrial assessment : 200 marks (in two spells of 100

mark each) Maintenance of logbook : 30 marks

Record Work : 30 marks

Seminar/viva-voce : 40 marks

TOTAL : 300marks

The assessment at the institute level will be done by a minimum of three members Internal Faculty, Industrial Experts and H.O.D. and be averaged.

2.3 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 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.

2.4 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, with the condition that the duration including Improvement examination shall not exceed FIVE years from the first admission.
4. No improvement is allowed in Practical / Lab subjects or Project work or Industrial Training assessment. However, improvement is allowed in drawing subject.
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.

3 RULES OF PROMOTION TO NEXT LEVEL:

3.1 For Diploma Courses (Except HMCT, Architecture, Chemical-Sugar & Auto mobile Engineering) From 1ST YEAR TO 3rd, 4th, 5th, 6th and 7th Semesters:

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

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 on fulfillment of 3(i)(ii) clauses stated above. 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 not have failed in more than 6 subjects of 1st year, 3rd & 4th semesters put together.

For IVC students.

- i) Puts the required percentage of attendance in the 5th semester
- ii) Should not have failed in more than Four backlog subjects of III & IV Semesters
5. A candidate shall be promoted to 6th semester provided he/she has puts 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 examination if he/she

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

For IVC students

- i) Puts the required percentage of attendance in the 6th semester
- ii) Should have completed the Industrial Training.
- iii) Should not have failed in more than Four backlog subjects of III, IV & V Semester put together.

3.2 For HMCT, Architecture and Chemical - Sugar courses

- 1) The same rules are applicable on par with other diploma courses with the exception that the Industrial Training is in the 5th semester.
- 2) A candidate shall be promoted to 5th semester (Industrial Training) provided he/she puts the required percentage of attendance in the 4th semester and pay the examination fee. A candidate, who could not pay the 4th semester examination fee, has to pay the promotion fee as prescribed by the SBTET from time to time before commencement of 5th semester (Industrial Training).
- 3) A candidate shall be promoted to 6th semester of the course provided he/ she has successfully completed the Industrial Training (Passed).

A candidate is eligible to appear for the 6th semester examination if he/ she Puts the required percentage of attendance in 6th semester.

For IVC students

- i. Puts the required percentage of attendance in the 6th semester
- ii. Should not have failed in more than 6 subjects of 1st year, 3rd & 4th semesters put together.

For IVC students.

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

3.3 For Diploma Courses of 3 ½ Years duration:

3.31 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 Four backlog subjects of 1st year. **9**
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.
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 would be 90 % attendance and attends for the VIVA-VOCE examination at the end of training.
6. A candidate shall be promoted to 7th semester of the course provided he/she has successfully completed both the spells of Industrial Training (Passed).

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

- i) Put the required percentage of attendance in the 7th semester and
- ii) Should not have failed in more than 6 backlog subjects of 1st year, 3rd and 4th semesters put together.
- iii) Should not have failed in more than six backlog subjects of 3rd and 4th semester put together for IVC students.

3.32 For Diploma Courses of 3 ½ Years duration: FW

- i) In respect of Diploma in Footwear Technology, the Industrial training is offered in two spells, the 1st spell of Industrial training after the First Year (i.e. III semester of the course) and the second spell of industrial training after the V semester (i.e VI Semester of the course). The promotion rules for this course are on par with the other sandwich Diploma courses except that there is no restriction on number of backlog subjects to get eligibility to appear for the 4th semester examination and ,

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

1. Puts the required percentage of attendance in the 5th semester and
2. Should not have failed in more than four subjects of 1st year.
- ii) A candidate shall be promoted to 7th semester of the course provided he/ she has successfully completed second spell of Industrial Training (Passed).

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

1. Puts the required percentage of attendance in the 7th semester and
2. Should not have failed in more than 6 backlog subjects of 1st year and 4th semesters put together.
3. Should not have failed in more than six backlog subjects of 4th and 5th semester

put together for IVC students.

3.3.3 For Diploma Courses of 3 ½ Years duration: BM

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

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).

OR

Run through system for 1st Year and 3rd semester to 6/7th semester provided that the student puts in 75% of attendance (which can be condoned on medical grounds upto 10%) i.e. attendance after condonation on medical grounds should not be less than 65%.

3.4 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 1st spell of Industrial training shall commence 10 days after the completion of the last theory examination of 4th Semester.
- c) The 2nd spell of Industrial training shall commence within 10 days after the completion of 1st spell of Industrial training.
- d) Each Semester of Institutional study shall be a minimum of 90 working days. (With 6 working days in a week i.e. from Monday to Saturday, with 7 periods of 50 minutes, duration per day).

4 STUDENTS PERFORMANCE EVALUATION

4.1 AWARD OF DIPLOMA

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 1 year marks + 100% of 3rd and subsequent Semesters.

With respect to the intermediate vocational 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 alone 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 three years and four subsequent examinations, from the first admission.

4.2 EXAMINATION FEE SCHEDULE:

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

4.3 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 hour's duration.

- a) Each theory paper consists of Section 'A' and Section 'B'. Section 'A' contains 20 short answer questions out of which 15 questions are to be answered and each carries 2 marks. Max. Marks: $15 \times 2 = 30$.

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: $5 \times 10 = 50$. 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: $4 \times 5 = 20$. Section 'B' contains six (6) questions. Out of which four (4) questions to be answered and each question carries 10 Marks. Max. Marks $4 \times 10 = 40$.

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%

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.

4.4 ISSUE OF MEMORANDUM 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, Telangana. for each duplicate memo.

4.5 MAXIMUM PERIOD FOR COMPLETION OF DIPLOMA COURSES:

Maximum period for completion of the course 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.

4.6 ELIGIBILITY FOR AWARD OF DIPLOMA

A candidate is eligible for award of Diploma Certificate if he / she fulfil 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.

4.7 RECOUNTING,ISSUEOFPHOTOCOPYOFVALUEDANSWERSSCRIPT&REVERIFICATION:

- 4.7.1 a) A candidate desirous of applying for Recounting/ issue of Photocopy of valued answer scripts/ Reverification should submit the application to the Secretary, State Board of Technical Education and Training, Telangana., Hyderabad – 500 063 within 15 days from the date of receipt of Tabulated Marks Statement by the Principal of concerned Polytechnic or the date specified.

Recounting shall be done for any TWO theory subjects per Year/Semester only, including drawing subjects. No request for recounting shall be entertained from any candidate who is reported to have resorted to Malpractice in that examination. The fee prescribed for Recounting should be paid by way of Demand Draft drawn on any Scheduled Bank payable at Hyderabad in favour of the Secretary, State Board of Technical Education and Training, Telangana., Hyderabad. The verification of the totaling will be done by an Officer of the Board and will be intimated to the candidate by post only.

The following documents should be invariably be enclosed with the application failing which the application will not be considered.

1. Marks secured as per Tabulated Marks Sheet certified by the Principal.
2. Demand draft towards the payment of fee
3. Self – addressed and stamped envelopes of 11" X 5" size.

The applications received after the prescribed date will not be accepted and any correspondence in this regard will not be entertained.

4.7.2 FORISSUEOFPHOTOCOPIESOFVALUEDANSWERSSCRIPTS

1. A candidate desirous of applying for Photo copy of valued answer script/scripts should submit the application to the Secretary, State Board of Technical Education and Training, Telangana., Hyderabad – 500 063 along with the required fee in the form of Demand Draft within 07 days from the date of receipt of Tabulated Marks Statement by the Principal of concerned Polytechnic or the date specified in the covering letter whichever is earlier.
2. Photo copies of valued answer scripts will be issued to all theory subjects including drawing subjects.
3. The following documents should invariably be enclosed with the application
 - (1) Marks secured as per Tabulated Marks Sheets certified by the Principal
 - (2) Self-addressed Stamped Envelope/Cloth-line cover of size 10" x 14".
 - (3) Fee in the form of Demand Draft

4.7.3 FORRE-VERIFICATIONOFTHEVALUEDANSWERSSCRIPT

1. A candidate desirous of applying for Re-verification of valued answer script should submit the application to the Secretary, State Board of Technical Education and Training, Telangana., Hyderabad – 500 063 along with the required fee in the form of Demand Draft, within 15 days from declaration of result.
2. Re-verification of valued answer script shall be done for all theory subjects including drawing subjects.
3. The following documents should invariably be enclosed with the application failing which the application will not be considered.
 - (i) Marks secured as per Tabulated Marks Sheets certified by the Principal.
 - (ii) Fee in the form of Demand Draft.

4.7.4 MALPRACTICECASES:

If any candidate resorts to any Mal Practice during examinations, he / she shall be booked and the Punishment shall be awarded as per rules and regulations framed by SBTET from time to time.

4.7.5 DISCREPANCIES/PLEAS:

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

5 ISSUEOFCERTIFICATESANDVETO

5.1. ISSUEOFDUPLICATEDIPLOMA

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, Telangana 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.

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.

5.2 ISSUEOFMIGRATIONCERTIFICATEANDTRANSCRIPTS:

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

5.3 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 Hyderabad.

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

DIPLOMA IN COMPUTER ENGINEERING
C-16, SCHEME OF INSTRUCTIONS AND EXAMINATION
FIRST YEAR

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Year	Scheme Of Examinations			
		Theory	Practicals		Duration (In Hrs.)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
CM-101	English-I	2	-	60	3	30	70	100
CM-102	Engineering Mathematics - I	5	-	150	3	20	80	100
CM-103	Engineering Physics	4	-	120	3	20	80	100
CM-104	Engineering Chemistry & Environmental studies	4	-	120	3	20	80	100
CM-105	Computer Fundamentals & Office Automation	4	-	120	3	20	80	100
CM-106	Programming in C	5	-	150	3	20	80	100
PRACTICAL SUBJECTS								
CM-107	Engineering Drawing	-	6	180	3	40	60	100
CM-108	C Programming Lab	-	6	180	3	40	60	100
CM-109	Physics Lab	-	1 1/2	45	3	20	30	50
CM-110	Chemistry Lab	-	1 1/2	45	3	20	30	50
CM-111	Computer Fundamentals & Office Automation Lab	-	3	90	3	40	60	100
	Total	24	18	1260	-	290	710	1000

CM-101,102,103,104,107,109, 110 Common with All Branches

CM-105, 106,108, 111 Common with Information Technology (IT)

DIPLOMA IN COMPUTER ENGINEERING
C-16, SCHEME OF INSTRUCTIONS AND EXAMINATION
III SEMESTER

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Year	Scheme Of Examinations			
		Theory	Practical		Duration (No. of Periods)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
CM-301	Mathematics –II	4	-	60	3	20	80	100
CM-302	Basic Electrical & Electronics Engineering	4	-	60	3	20	80	100
CM-303	Digital Electronics	4	-	60	3	20	80	100
CM-304	Computer Organization	5	-	75	3	20	80	100
CM-305	OOP through C++	5	-	75	3	20	80	100
CM-306	RDBMS	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								
CM-307	Digital Electronics Lab	-	3	45	3	40	60	100
CM-308	OOP through C++ Lab	-	6	90	3	40	60	100
CM-309	RDBMS Lab	-	3	45	3	40	60	100
CM-310	Communication skills Lab	-	3	45	3	40	60	100
	Total	27	15	630		280	720	1000

CM-301 Common with All Branches

All Subjects - Common with Information Technology (IT)

DIPLOMA IN COMPUTER ENGINEERING
C-16, SCHEME OF INSTRUCTIONS AND EXAMINATION
IV 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								
CM-401	.Net Programming	5	-	75	3	20	80	100
CM-402	Operating systems	5	-	75	3	20	80	100
CM-403	Computer Hardware & Maintenance	5	-	75	3	20	80	100
CM-404	Microprocessors	5	-	75	3	20	80	100
CM-405	Data Structures through C++	5	-	75	3	20	80	100
CM-406	Web designing	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								
CM-407	. Net Programming Lab	-	3	45	3	40	60	100
CM-408	Web designing Lab	-	3	45	3	40	60	100
CM-409	Computer hardware&hMicroprocessors Lab	-	3	45	3	40	60	100
CM-410	Data Structures through C++ Lab	-	3	45	3	40	60	100
	Total	30	12	630	-	280	720	1000

All Subjects - Common with Information Technology(IT)

DIPLOMA IN COMPUTER ENGINEERING

**C-16, SCHEME OF INSTRUCTIONS AND EXAMINATION
V SEMESTER**

Subject Code	Name of the Subject	Instruction period / week		Total Period / Sem	Scheme of Examination			
		Theory	Practical/ Tutorial		Duration (hours)	Sessional Marks	End Exam Marks	Total Marks
THEORY:								
CM- 501	Industrial Management & Entrepreneurship	5	-	75	3	20	80	100
CM-502	Java Programming	5	-	75	3	20	80	100
CM -503	System Administration	5	-	75	3	20	80	100
CM -504	Computer Networks	5	-	75	3	20	80	100
CM - 505	Software Engineering	5	-	75	3	20	80	100
CM - 506(A)	ADBMS	5	-	75	3	20	80	100
CM - 506(B)	Mobile Communications							
CM - 506(C)	Cryptography & Network Security							
PRACTICAL:								
CM- 507	Java Programming Lab	-	3	45	3	40	60	100
CM -508	System Administration Lab	-	3	45	3	40	60	100
CM -509	Computer Networking Lab	-	3	45	3	40	60	100
CM -510	Project work	-	3	45	3	40	60	100
TOTAL		30	12	630		280	720	1000

CM-601: IME is common with DECE , IT

**DIPLOMA IN COMPUTER ENGINEERING
C-16, SCHEME OF INSTRUCTIONS AND EXAMINATION
VI SEMESTER**

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Pract-icals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
CM-601	Industrial Training	6 Months						

Common with Information Technology(IT)

1st YEAR

ENGLISH
(Common to all Branches)

Subject Title: English
Subject Code : CM - 101
Periods per Week : 03
Periods per Year : 90

Time Schedule

SI No	Major Topics	No. of Periods	Weightage of Marks	No of Short Answers	No of Long Answers
1	Speaking	19	20	10	-
2	Listening	06	04	02	-
3	Reading	12	10	-	1
4	Grammar	27	34	07	2
5	Writing	26	52	01	5
				-	-
		90	120	20	08

Introduction

Globalization has ushered in an era of opportunities for those who have the necessary competencies. Effective communication is one among them. In C-16 Curriculum the focus is therefore on improving communicative abilities resulting in students becoming industry – ready and employable.

Objectives:

- On completion of the course the students shall be able to
- Understand basic principles of language usage and apply them
 - Read and comprehend passages
 - Write short paragraphs, letters and reports
 - Use English appropriately in day-to-day communication

Specific Instructional objectives

1.0 Practice spoken communication suited to various situations.

- 1.1 Use proper expressions to make requests
- 1.2 Use proper expressions for asking and giving directions
- 1.3 Use suitable expressions to state feelings
- 1.4 Use suitable expressions to express obligations
- 1.5 Use suitable expressions to extend and accept invitations
- 1.6 Fix and cancel appointments
- 1.7 Express likes and dislikes
- 1.8 Give instructions
- 1.9 Use everyday expressions in the class room

2 0 Listen and understand.

- 2.1 Main ideas
- 2.2 Specific details
- 2.3 Make inferences

3.0 Read and comprehend English.

- 3.1 Identify main ideas
- 3.2 Identify specific details
- 3.3 Draw inferences
- 3.4 Give contextual meanings of the words
- 3.5 Perceive tone in a text

4.0 Learn various grammatical structures.

- 4.1 Use the present tense
- 4.2 Use the past tense
- 4.3 Use the future tense
- 4.4 Identify and use adjectives
- 4.5 Use prepositions
- 4.6 State basic sentence structures
- 4.7 Frame questions to elicit information
- 4.8 Frame questions for confirmation
- 4.9 Use active voice
- 4.10 Use passive voice
- 4.11 Use indirect speech
- 4.12 Use direct speech

5.0 Learn to excel in various forms of written communication.

- 5.1 Identify components of a good paragraph
- 5.2 Write different types of paragraphs
- 5.3 Distinguish between formal and informal letters
- 5.4 Write personal letters
- 5.5 Write official letters
- 5.6 Prepare a resume
- 5.7 Write a cover letter
- 5.8 Report industrial visits
- 5.9 Make notes
- 5.10 Present and interpret data from flow chart, tree diagram and table

Course Material

The text book prepared by the faculty of English of Polytechnics.

Reference Books

- 1. Essential English Grammar Raymond Murphy
- 2. Learn English SantanuSinhaChaudhuri
- 3. Grammar Builder Oxford University Press
- 4. Word Power made Easy Norman Lewis
- 5. Spoken English Shashi Kumar and Dhamija
- 6. English Grammar and Composition – David Greene (McMillan)

Engineering Mathematics – I (Common to all)

Subject Title : Engineering Mathematics-I
 Subject Code : CM-102
 Periods per week : 05
 Periods per Semester : 150

Blue Print

S. No	Major Topic	No of Periods		Weightage of Marks	Short Type			Essay Type		
		Theory	Practice		R	U	App	R	U	App
	Unit - I : Algebra									
1	Logarithms	3	1	2	1	0	0	0	0	0
2	Partial Fractions	5	1	4	1	1	0	0	0	0
3	Matrices and Determinants	20	6	16	1	2	0	0	½	½
	Unit - II : Trigonometry									
4	Compound Angles	5	2	2	1	0	0	0	0	0
5	Multiple and Submultiple angles	6	2	4	1	1	0	0	0	0
6	Transformations	8	3	10	0	0	0	0	½	½
7	Inverse Trigonometric Functions	8	3	10	0	0	0	0	½	½
8	Properties of triangles	2	0	2	1	0	0	0	0	0
9	Hyperbolic Functions	2	0	0	0	0	0	0	0	0
10	Complex Numbers	4	2	4	1	1	0	0	0	0
	Unit III : Co-ordinate Geometry									
11	Straight Lines	4	2	9	1	1	0	0	½	0
12	Circles	5	2	9	1	1	0	0	½	0
	Unit – IV : Differential Calculus									
13	Limits and Continuity	6	2	4	1	1	0	0	0	0
14	Differentiation	22	10	24	1	1	0	0	1	1
	Unit - V : Applications of Differentiation									
	Unit - V : Applications of Differentiation									
15	Geometrical Applications	5	2	10	0	0	0	0	0	1
16	Maxima and Minima	5	2	10	0	0	0	0	0	1
Total		110	40	120	11	9			3½	4½
				Marks	22	18	0	0	35	45

R: Remembering type

22 marks

U: Understanding type **53** marks
App: Application type **45** marks
ENGINEERING MATHEMATICS – I
COMMON TO ALL BRANCHES – 102

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

$$\begin{array}{ll} i) \frac{f(x)}{(x+a)(x+b)(x+c)} & ii) \frac{f(x)}{(x+a)^2(x+b)(x+c)} \\ iii) \frac{f(x)}{(x^2+a)(x+b)} & iv) \frac{f(x)}{(x+a)(x^2+b)^2} \end{array}$$

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 (emphasis on 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 a 3x3 square matrix 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 Apply the properties of determinants to solve problems.
- 3.12 Solve system of 3 linear equations in 3 unknowns using Cramer's rule.
- 3.13 Define multiplicative inverse of a matrix and list properties of adjoint and inverse.
- 3.14 Compute adjoint and multiplicative inverse of a square matrix.
- 3.15 Solve system of 3 linear equations in 3 unknowns by matrix inversion method
- 3.16 State elementary row operations.
- 3.17 Solve a system of 3 linear equations in 3 unknowns by Gauss- Jordan method

UNIT – II

Trigonometry :

4.0 Solve simple problems on Compound Angles

- 4.1 Define compound angles and state the formulae of $\sin(A\pm B)$, $\cos(A\pm B)$, $\tan(A\pm B)$ and $\cot(A\pm B)$
- 4.2 Give simple examples on compound angles to derive the values of $\sin 15^\circ$, $\cos 15^\circ$, $\sin 75^\circ$, $\cos 75^\circ$, $\tan 15^\circ$, $\tan 75^\circ$ etc.
- 4.3 Derive identities like $\sin(A+B) \cdot \sin(A-B) = \sin^2 A - \sin^2 B$ etc.,
- 4.4 Solve simple problems on compound angles.

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

- 5.1 Derive the formulae of multiple angles $2A$, $3A$ etc and sub multiple angles $A/2$ in terms of angle A of trigonometric functions.
- 5.2 Derive useful allied formulas like $\sin^2 A = (1 - \cos 2A)/2$ etc.
- 5.3 Solve simple problems using the above formulae

6.0 Apply Transformations for solving the problems in Trigonometry

- 6.1 Derive the formulae on transforming sum or difference of two trigonometric ratios in to a product and vice versa- examples on these formulae.
- 6.2 Solve problems by applying these formulae to sum or difference or product of three or more terms.

7.0 Use Inverse Trigonometric Functions for solving engineering problems

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

- 7.2 Define inverses of six trigonometric functions along with their domains and ranges.
- 7.3 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.
- 7.4 State various properties of inverse trigonometric functions and identities like $\sin^{-1}x + \cos^{-1}x = \frac{\pi}{2}$ etc.
- 7.5 Derive formulae like $\tan^{-1}x + \tan^{-1}y = \tan^{-1}\left(\frac{x+y}{1-xy}\right)$, where $x \geq 0, y \geq 0, xy < 1$ etc., and solve simple problems.

8.0 Appreciate Properties of triangles

- 8.1 State sine rule, cosine rule, tangent rule and projection rule .

9.0 Represent the Hyperbolic Functions in terms of logarithm functions

- 9.1 Define Sinh x, cosh x and tanh x and list the hyperbolic identities.
- 9.2 Represent inverse hyperbolic functions in terms of logarithms.

10.0 Represent Complex numbers in various forms

- 10.1 Define complex number, its modulus , conjugate and list their properties.
- 10.2 Define the operations on complex numbers with examples.
- 10.3 Define amplitude of a complex number
- 10.4 Represent the complex number in various forms like modulus-amplitude (polar) form, Exponential (Euler) form – illustrate with examples.

UNIT - III

Coordinate Geometry

11.0 Solve the problems on Straight lines

- 11.1 Write the different forms of a straight line – point slope form, two point form, intercept form, normal form and general form
- 11.2 Solve simple problems on the above forms
- 11.3 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.

12.0 Solve the problems on Circles

- 12.1 Define locus of a point – circle and its equation.

- 12.2 Find the equation of a circle given
- Center and radius
 - Two ends of a diameter
 - Centre and a point on the circumference
 - Three non-collinear points
 - Centre and tangent
- 12.3 Write the general equation of a circle and find the centre and radius.
- 12.4 Write the equation of tangent and normal at a point on the circle.
- 12.5 Solve the problems to find the equations of tangent and normal.

UNIT - IV

Differential Calculus

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

- 13.1 Explain the concept of limit and meaning of $\lim_{x \rightarrow a} f(x) = l$ and state the properties of limits .

- 13.2 Mention the Standard limits $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$, $\lim_{x \rightarrow 0} \frac{\sin x}{x}$, $\lim_{x \rightarrow 0} \frac{\tan x}{x}$, $\lim_{x \rightarrow 0} \frac{a^x - 1}{x}$, $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$, $\lim_{x \rightarrow 0} (1+x)^{\frac{1}{x}}$, $\lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x$ (All without proof).

- 13.3 Solve the problems using the above standard limits

- 13.4 Evaluate the limits of the type $\lim_{x \rightarrow l} \frac{ax^2 + bx + c}{\alpha x^2 + \beta x + \gamma}$ and $\lim_{x \rightarrow \infty} \frac{f(x)}{g(x)}$

- 13.5 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.

14.0 Appreciate Differentiation and its meaning in engineering situations

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

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

- 14.2 State the significance of derivative in scientific and engineering applications.
- 14.3 Find the derivatives of elementary functions like x^n , a^x , e^x , $\log x$, $\sin x$, $\cos x$, $\tan x$, $\sec x$, $\csc x$ and $\cot x$ using the first principles.
- 14.4 Find the derivatives of simple functions from the first principle .
- 14.5 State the rules of differentiation of sum, difference, scalar multiplication, product and quotient of functions with illustrative and simple examples.

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

$$(i) \sqrt{t^2 + \frac{2}{t}} \quad (ii) x^2 \sin 2x \quad (iii) \frac{x}{\sqrt{x^2 + 1}} \quad (iv)$$

$$\log(\sin(\cos x)).$$

- 14.7 Find the derivatives of Inverse Trigonometric functions and examples using the Trigonometric transformations.
- 14.8 Explain the method of differentiation of a function with respect to another function and also differentiation of parametric functions with examples.
- 14.9 Find the derivatives of hyperbolic functions.
- 14.10 Explain the procedures for finding the derivatives of implicit function with examples.
- 14.11 Explain the need of taking logarithms for differentiating some functions with examples like $[f(x)]^{g(x)}$.
- 14.12 Explain the concept of finding the higher order derivatives of second and third order with examples.
- 14.13 Explain the concept of functions of several variables, partial derivatives and difference between the ordinary and partial derivatives with simple examples.
- 14.14 Explain the definition of Homogenous function of degree n
- 14.15 Explain Euler's theorem for homogeneous functions with applications to simple problems.

UNIT - V

Applications of the Differentiation

15.0 Understand the Geometrical Applications of Derivatives

- 15.1 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.
- 15.2 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.
- 15.3 Find the lengths of tangent, normal, sub-tangent and sub normal at any point on the curve $y=f(x)$.
- 15.4 Explain the concept of angle between two curves and procedure for finding the angle between two given curves with illustrative examples.

16.0 Use Derivatives to find extreme values of functions

- 16.1 Define the concept of increasing and decreasing functions.

- 16.2 Explain the conditions to find points where the given function is increasing or decreasing with illustrative examples.
- 16.3 Explain the procedure to find the extreme values (maxima or minima) of a function of single variable- simple problems yielding maxima and minima.
- 16.4 Solve problems on maxima and minima in applications like finding areas, volumes, etc.

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:

$$\begin{array}{ll}
 i) \quad \frac{f(x)}{(x+a)(x+b)(x+c)} & ii) \quad \frac{f(x)}{(x+a)^2(x+b)(x+c)} \\
 iii) \quad \frac{f(x)}{(x^2+a)(x+b)} & iv) \quad \frac{f(x)}{(x+a)(x^2+b)^2}
 \end{array}$$

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 3 variables-Solutions by Cramers's rule, Matrix inversion method-examples-Elementary row operations on matrices -Gauss-Jordan method to solve a system of equations.

Unit-II

Trigonometry :

4. Compound angles: Formulas of $\sin(A \pm B)$, $\cos(A \pm B)$, $\tan(A \pm B)$, $\cot(A \pm B)$, and related identities with problems.

5. Multiple and sub-multiple angles: trigonometric ratios of multiple angles $2A, 3A$ and submultiple angle $A/2$ with problems.
6. Transformations of products into sums or differences and vice versa simple problems
7. Inverse trigonometric functions : definition, domains and ranges-basic properties- problems.
8. Properties and solutions of triangles: relation between sides and angles of a triangle- sine rule, cosine rule, tangent rule and projection rule – statements only .
9. Hyperbolic functions: Definitions of hyperbolic functions, identities of hyperbolic functions, inverse hyperbolic functions and expression of inverse hyperbolic functions in terms of logarithms.
10. 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.

UNIT-III

Coordinate geometry

11. Straight lines: various forms of straight lines, angle between lines, perpendicular distance from a point, distance between parallel lines-examples.
12. 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 and (v) centre and tangent equation - general equation of a circle - finding center, radius: tangent, normal to circle at a point on it.

UNIT-IV

Differential Calculus

13. Concept of Limit- Definition- Properties of Limits and Standard Limits -Simple Problems-Continuity of a function at a point- Simple Examples only.
14. 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:

15. Geometrical meaning of the derivative, equations of Tangent and normal to a curve at any point. Lengths of tangent, normal, subtangent and subnormal to the curve at any point . Angle between the curves - problems.
16. 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.

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

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

TIMESCHEDULE

S.No	Major Topics	No. of Periods	Weightage of Marks	Short Answer Type (2 marks)	Essay Type (10 marks)
1.	Units and Dimensions	08	04	2	-
2.	Elements of Vectors	12	14	2	1
3.	Kinematics	12	14	2	1
4.	Friction	08	04	2	-
5.	Work, Power and Energy	12	12	1	1
6.	Simple Harmonic Motion	12	14	2	1
7.	Heat & Thermodynamics	12	14	2	1
8.	Sound	12	14	2	1
9.	Properties of matter	08	04	2	-
10.	Electricity & magnetism	14	14	2	1
11.	Modern Physics	10	12	1	1
	Total:	120	120	20	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 (without problems)
- 1.15 State the limitations of dimensional analysis

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 a vector graphically
- 2.5 Classify the Types of 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 an 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 product of two vectors and state formulae for torque and 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 equation 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 an expression for 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 and state its causes
- 4.2 Classify the types of friction
- 4.3 Explain the concept of Normal reaction
- 4.4 State the laws of friction
- 4.5 Define coefficient 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 List the Advantages and Disadvantages of friction
- 4.10 Mention the methods of minimizing friction
- 4.11 Solve the related numerical problems

5.0 Understand the concept of Work, Power, and Energy

- 5.1 Define the terms Work, Power and Energy.
- 5.2 State SI units and dimensional formula for Work, Power, and Energy
- 5.3 Define potential energy
- 5.4 Derive an expression for Potential energy with examples
- 5.5 Define kinetic energy

- 5.6 Derive an expression for kinetic energy with examples
- 5.7 State and prove Work-Energy theorem
- 5.8 Explain the relation between Kinetic energy and momentum
- 5.9 State the law of conservation of energy
- 5.10 Verify the law of conservation of energy in the case of a freely falling body
- 5.11 Solve the related numerical problems

6.0 Understand the concept of Simple harmonic motion

- 6.1 Define Simple harmonic motion
- 6.2 State the conditions of Simple harmonic motion
- 6.3 Give examples for Simple harmonic motion
- 6.4 Show that the tip of the projection of a body moving in circular path with uniform speed is SHM
- 6.5 Derive an expression for displacement of a body executing SHM
- 6.6 Derive an expression for velocity of a body executing SHM
- 6.7 Derive an expression for acceleration of a body executing SHM
- 6.8 Derive expressions for Time period and frequency of SHM
- 6.9 Define phase of SHM
- 6.10 Derive expression for Time period of a simple pendulum
- 6.11 State the laws of simple pendulum
- 6.12 Explain seconds pendulum
- 6.13 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 Explain Boyle's law
- 7.3 State Charles's laws in terms of absolute temperature
- 7.4 Define absolute zero temperature
- 7.5 Explain absolute scale of temperature
- 7.6 Define ideal gas
- 7.7 Derive the ideal gas equation.
- 7.8 Define gas constant and Universal gas constant
- 7.9 Explain why universal gas constant is same for all gases
- 7.10 State SI unit of universal gas constant
- 7.11 Calculate the value of universal gas constant
- 7.12 State the gas equation in terms of density
- 7.13 Distinguish between n and R
- 7.14 Define isothermal process
- 7.15 Define adiabatic process
- 7.16 Distinguish between isothermal and adiabatic process
- 7.17 State first and second laws of thermodynamics
- 7.18 Define specific heats & molar specific heats of a gas
- 7.19 Derive the relation $C_p - C_v = R$
- 7.20 Solve the related numerical problems

8.0 Understand the concept of Sound

- 8.1 Define the terms sound
- 8.2 Explain longitudinal and transverse wave motion
- 8.3 Distinguish between musical sound and noise
- 8.4 Explain noise pollution and state SI unit for noise
- 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 List the applications of beats
- 8.10 Define Doppler effect
- 8.11 List the Applications of Doppler effect
- 8.12 Explain reverberation and reverberation time
- 8.13 Write Sabine's formula
- 8.14 Explain echoes
- 8.15 State conditions of a good auditorium
- 8.16 Solve the related numerical problems

9.0 Understand the properties of matter

- 9.1 Define terms Elasticity and plasticity
- 9.2 Define the terms stress and strain
- 9.3 State the units and dimensional formulae for stress and strain
- 9.4 State the Hooke's law
- 9.5 Define the surface tension
- 9.6 Explain Surface tension with reference to molecular theory
- 9.7 Define angle of contact
- 9.8 Define capillarity and state examples
- 9.9 Write the formula for surface tension based on capillarity
- 9.10 Explain the concept of Viscosity
- 9.11 Provide examples for surface tension and Viscosity
- 9.12 State Newton's formula for viscous force
- 9.13 Define co-efficient of viscosity
- 9.14 Explain the effect of temperature on viscosity of liquids and gases
- 9.15 State Poiseuille's equation for Co-efficient of viscosity
- 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 the Ohm's law
- 10.3 Explain the Ohm's law
- 10.4 Define specific resistance, conductance and 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 Explain the basic concept of Meter Bridge with legible sketch
- 10.10 Explain the concept of magnetism
- 10.11 State the Coulomb's inverse square law of magnetism
- 10.12 Define magnetic field and magnetic lines of force
- 10.13 State the Magnetic induction field strength - units and dimensions
- 10.14 Describe the moment of couple on a bar magnet placed in a uniform magnetic field
- 10.15 Solve the related numerical problems

11.0 Understand the concept of Modern physics

- 11.1 Explain Photo-electric effect
- 11.2 Write Einstein's photoelectric equation
- 11.3 State the laws of photoelectric effect
- 11.4 Explain the Working of a 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 basic principle of optical Fiber
- 11.10 Mention types of optical fibers
- 11.11 List the applications of optical Fiber
- 11.12 Define superconductor and superconductivity
- 11.13 List the examples 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- Applications and limitations of Dimensional analysis.

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 friction – Motion of a body over a horizontal surface- 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- second pendulum- Problems

7. Heat and Thermodynamics:

Expansion of Gases- Boyle's law- Absolute scale of temperature- Charles's laws- Ideal gas equation- Universal gas constant- Differences between r and R - Isothermal and adiabatic processes- Laws of thermodynamics- Specific heats of gases - 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- Condition 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-moment of couple-problems.

11. Modern Physics;

Photoelectric effect –Einstein's photoelectric equation-laws of photoelectric effect-photoelectric cell–Applications of photoelectric effect- Total internal reflection- fiber optics- -principle of an optical fiber-types of optical fibers - Applications of optical fibers- concepts of superconductivity-applications

REFERENCE BOOKS

- | | |
|---------------------------------------|--------------------------|
| 1. Intermediate physics Volume- I & 2 | Telugu Academy |
| 2. Text book of physics | Resnick & Holiday |
| 3. Engineering physics | Gaur and Gupta |
| 4. Fundamental Physics Volume -1 & 2 | K.L.Gomber and K.L.Gogia |

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	04	2	0	0	0	0	0
2.	Elements of Vectors	12	14	0	0	2	0	0	1
3.	Kinematics	12	14	0	2	0	1	0	0
4.	Friction	08	04	2	0	0	0	0	0
5.	Work, Power and Energy	12	12	0	0	1	0	1	0
6.	Simple Harmonic Motion	12	14	0	0	2	0	1	0
7.	Heat & Thermodynamics	12	14	0	2	0	1	0	0
8.	Sound	12	14	0	2	0	0	1	0
9.	Properties of Matter	08	04	1	1	0	0	0	0
10.	Electricity & magnetism	14	14	0	2	0	0	0	1
11.	Modern Physics	10	12	1	0	0	0	1	0
	Total:	120	120	6	9	5	2	4	2

ENGG.CHEMISTRY&ENVIRONMENTALSTUDIES
(CommonSubject)

SubjectTitle :Engg.Chemistry&EnvironmentalStudies
 SubjectCode :CM-104
 Totalperiodspereyear :120
 Curriculum : C-16

Blue Print

S.No	Major topic	No of Periods	Weight age of marks	Short Type (2 Marks)	Essay Type (10 Marks)	Remarks
1	Fundamentals of Chemistry	18	18	4	1	
2	Solutions	10	9	2	½	5 mark
3	Acids and bases	10	9	2	½	5 mark
4	Principles of Metallurgy	10	10	0	1	
5	Electrochemistry	14	14	2	1	
6	Corrosion	8	10	0	1	
7	Water Technology	14	14	2	1	
8	Polymers	12	14	2	1	
9	Fuels	6	4	2	0	
10	Environmental Studies	18	18	4	1	
	Total	120	120	20	08	
				40	80	

OBJECTIVES

Upon completion of the course the student shall be able to

A. ENGINEERING CHEMISTRY

1.0 Fundamentals of Chemistry

- 1.1 Explain the fundamental particles of an atom like electron, proton and neutron etc.,
- 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 concept of Quantum numbers with examples
- 1.5 Explain 1. Aufbau's principle, 2. Hund's rule and 3. Pauli's exclusion principle with examples.
- 1.6 Define Orbital.
- 1.7 Draw the shapes of s, p and d Orbitals.
- 1.8 Distinguish between Orbital and Orbit
- 1.9 Write the electronic configuration of elements up to atomic number 30
- 1.10 Define chemical bond.
- 1.11 Explain the Postulates of Electronic theory of valency
- 1.12 Define and explain three types of Chemical bonding viz., Ionic, Covalent, Coordinate covalent bond with examples.

- 1.13 Explain bond formation in NaCl and MgO
- 1.14 List the Properties of Ionic compounds
- 1.15 Explain covalent bond formation in Hydrogen molecule, Oxygen molecule, and Nitrogen molecule using Lewis dot method.
- 1.16 List the Properties of Covalent compounds
- 1.17 Distinguish between ionic compounds and covalent compounds.
- 1.18 Define the terms 1. Oxidation, 2. Reduction 3. Oxidation number 4. Valency, with examples.
- 1.19 Calculate the Oxidation Number
- 1.20 Differentiate between Oxidation Number and Valency.

2.0 Solutions

- 2.1 Define the terms 1. Solution, 2. Solute and 3. Solvent
- 2.2 Classify solutions based on physical state.
- 2.3 Define solubility, unsaturated, saturated and super saturated solutions.
- 2.4 Define mole.
- 2.5 Explain Mole concept with examples.
- 2.6 Define the terms 1. Atomic weight, 2. Molecular weight and 3. Equivalent weight
- 2.7 Calculate Molecular weight and Equivalent weight of Acids, Bases and Salts.
- 2.8 Define Molarity and Normality.
- 2.9 Solve Numerical problems on Mole, Molarity and Normality

3.0 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 and bases.
- 3.4 State the limitations of Bronsted–Lowry theory of acids and 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's scale
- 3.9 Solve the Numerical problems on pH (Strong Acids and Bases)
- 3.10 Define buffer solution and give examples.
- 3.11 State the applications of buffer solutions.

4.0 Principles of Metallurgy

- 4.1 List the Characteristics of Metals.
- 4.2 Distinguish between Metals and Non Metals
- 4.3 Define the terms 1. Metallurgy 2. Mineral, 3. Ore, 4. Gangue, 5. Flux and 6. Slag
- 4.4 Describe Froth Floatation method of concentration of ore.
- 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. German silver,

and Nichrome

4.9 List the uses of following Alloys: Brass, German silver, Nichrome

5.0 Electrochemistry

5.1 Define the terms 1. conductor, 2. Insulator, 3. Electrolyte and 4. Non-electrolyte

5.2 Types of electrolytes.- strong and weak with examples.

5.3 Distinguish between metallic conductors and Electrolytic conductors.

5.4 Explain Arrhenius theory of electrolytic dissociation

5.5 Explain electrolysis of fused NaCl.

5.6 Explain Faraday's laws of electrolysis

5.7 Define Chemical equivalent, Electrochemical equivalent.

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

5.9 Define Galvanic cell

5.10 Explain the construction and working of Galvanic cell

5.11 Distinguish between electrolytic cell and galvanic cell

5.12 Explain the standard electrode potentials

5.13 Define electrochemical series and explain its significance.

5.14 Define and explain E_{cell} .

5.15 Solve the numerical problems on E_{cell}

6.0 Corrosion

6.1 Define the term corrosion

6.2 Explain the Factors influencing the rate of corrosion

6.3 Explain the concept of electrochemical theory of corrosion

6.4 Describe the formation of a) composition cell, b) stress cell c) concentration cell

6.5 Define rust and explain the mechanism of rusting of iron with chemical reactions.

6.6 Explain the methods of prevention of corrosion: a) Protective coatings

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

7.0 Water Technology

7.1 State the various Sources of water.

7.2 Define the terms soft water and hard water with examples

7.3 Define hardness of water.

7.4 Explain temporary and permanent hardness of water.

7.5 List the usual chemical compounds causing hardness (with Formulae)

7.6 Define Degree of hardness, units of hardness in ppm (mg/L) and numerical problems related to hardness.

7.7 Disadvantages of using hard water in industries.

7.8 Explain the methods of softening of hard water: a) permutit process b) Ion-Exchange process.

7.9 Essential qualities of drinking water.

7.10 Explain municipal treatment of water for drinking purpose.

7.11 Define Osmosis and Reverse Osmosis (RO).

7.12 List the advantages of RO

8.0 Polymers

- 8.1 Explain the concept of polymerisation
- 8.2 Describe the methods of polymerisation a) addition polymerisation b) condensation polymerization with examples.
- 8.3 Define the term plastic
- 8.4 Types of plastics with examples.
- 8.5 Distinguish between thermoplastics and thermosetting plastics
- 8.6 List the characteristics of plastics.
- 8.7 State the advantages of plastic over traditional materials
- 8.8 State the disadvantages of using plastics.
- 8.9 Explain the methods of preparation and uses of the following plastics:
1. Polythene, 2. PVC, 3. Teflon, 4. Polystyrene, 5. Urea formaldehyde
6. Bakelite (only flow chart i.e. without chemical equations).
- 8.10 Define the term natural rubber
- 8.11 State the structural formula of natural rubber
- 8.12 Explain the processing of natural rubber from latex
- 8.13 List the characteristics of natural rubber
- 8.14 Explain the process of vulcanization
- 8.15 List the characteristics of vulcanized rubber
- 8.16 Define the term elastomer
- 8.17 Describe the preparation and uses of the following synthetic rubbers a) Butyl rubber, b) Buna-S and c) Neoprene rubber

9.0 Fuels

- 9.1 Define the term fuel
- 9.2 Classify the fuels based on physical state—solid, liquid and gaseous fuels with examples.
- 9.3 Classify the fuels based on occurrence—primary and secondary fuels with examples.
- 9.4 List the characteristics of a good fuel.
- 9.5 State the composition and uses of the following 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 Define and understand the following terms 1). Lithosphere, 2). Hydrosphere, 3). Atmosphere, 4). Biosphere, 5) Pollutant, 6). Contaminant 7) Pollution 8) Receptor 9) Sink 10) Particulates, 11) Dissolved oxygen (DO), 12). Threshold limit value (TLV), 13). BOD, and 14). COD
- 1.4 Explain the growing energy needs
- 1.5 Explain renewable (non-conventional) and non-renewable (conventional) energy sources with examples.
- 1.6 Define an ecosystem. Understand biotic and abiotic components of ecosystem.
- 1.7 Define the terms:

- 1). Producers, 2). Consumers and 3). Decomposers with examples.
- 1.8 Explain biodiversity and threats to biodiversity
 - 1.9 Define air pollution
 - 1.10 Classify the air pollutants based on origin and states of matter
 - 1.11 Explain the causes of air pollution
 - 1.12 Explain the uses and overexploitation of forest resources
 - 1.13 Define and explain deforestation
 - 1.14 Explain the effects of air pollution on human beings, plants and animals
 - 1.15 Explain the greenhouse effect - ozone layer depletion and acid rain
 - 1.16 Explain the methods of control of air pollution
 - 1.17 Define water pollution
 - 1.18 Explain the causes of water pollution
 - 1.19 Explain the effects of water pollution on living and nonliving things
 - 1.20 Understand the methods of control of water pollution.

COURSE CONTENT

A. ENGINEERING CHEMISTRY

1. Fundamentals of Chemistry

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

Chemical Bonding: Introduction – Valency, types of chemical bonds – Ionic, covalent and co-ordinate covalent bond with examples – Properties of ionic and Covalent compounds

Oxidation-Reduction: Concepts of Oxidation-Reduction, Oxidation Number- calculations,

2. Solutions

Introduction-concentration terms – Mole concept, Molarity, Normality- Molecular weight, 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 – buffers solutions – Applications.

4. Principles of Metallurgy

Characteristics of Metals and distinction between Metals and Non Metals, Metallurgy, ore, Gangue, Flux, Slag - Concentration of Ore – 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 - Arrhenius theory of electrolytic dissociation – electrolysis – Faraday's laws of electrolysis- numerical problems – Galvanic cell – standard electrode potential – electro chemical series – emf and numerical problems on emf of a cell

6. Corrosion

Introduction - factors influencing the rate of corrosion - electrochemical theory of corrosion-composition, stress and concentration cells - rusting of iron and its mechanism - prevention of corrosion by coating methods, cathodic protection

7. 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 - numerical problems related to degree of hardness - drinking water - municipal treatment of water for drinking purpose - Osmosis, Reverse Osmosis - advantages of Reverse osmosis

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. Polyethylene 2. PVC 3. Teflon 4. Polystyrene 5. Urea formaldehyde 6. Bakelite - Rubber - Natural rubber - processing from latex - Vulcanization - Elastomers - Butyl rubber, Buna-s, Neoprene rubber and their uses.

9. Fuels

Definition and classification of fuels - characteristics of good fuel - 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

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, green house effect - ozone depletion - control of air pollution - Water pollution - causes - effects - control measures,

REFERENCE BOOKS

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

COMPUTER FUNDAMENTALS & OFFICE AUTOMATION

(Common with Information Technology)

Subject : Computer Fundamentals & Office Automation
Subject Code : CM - 105 / IT - 105
Periods per Week : 4
Periods per Year : 120

Objectives:

On completion of the study 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

TIME SCHEDULE AND BLUE PRINT										
Unit No	Major Topic	No of Periods		Weightage of marks	Short Type			Essay Type		
		Theory	Practice		R	U	App	R	U	App
1	Fundamentals of Computers	10	0	14	2	0	0	1	0	0
2	Number Systems	8	2	14	0	1	1	0	0	1
3	DOS Operating system	10	0	14	1	1	0	0	0	1
4	Windows Operating System	10	0	14	1	1	0	0	1	0
5	Features of MS-WORD	20	0	14	1	1	0	0	1	0
6	Features of MS-EXCEL	20	0	14	1	1	0	0	1	0
7	Features of POWERPOINT Presentation	15	0	9	1	1	0	0	½	0
8	Features of MS ACCESS	15	0	18	2	1	1	0	1	0
9	Features of Internet	10	0	9	1	0	1	0	½	0
	Total	118	2	120	10	7	3	1	5	2

- 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 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.

2.0 Understand Number systems

- 2.1. List the various number systems used in digital Computer.
- 2.2. State the importance of binary number system for use in Digital Computers
- 2.3. Convert decimal number into binary number.
- 2.4. Convert binary number into decimal number.
- 2.5. Convert binary number into hexadecimal number.
- 2.6. Convert hexadecimal number into binary number.
- 2.7. Explain the ASCII coding scheme.

2.8. Explain the EBCDIC coding scheme.

3.0 Understand DOS Operating Systems

- 3.1. Describe the need for an operating system.
- 3.2. Types of operating systems
- 3.3. List various operating systems used presently.
- 3.4. DOS Prompt.
- 3.5. Internal Commands - CD, MD, DIR, RD, COPY, COPYCON, TYPE, DEL, PATH, DATE, TIME
- 3.6. External Commands - ATTRIB, TREE, FORMAT, CHKDSK, DISKCOPY, SCANDSK, XCOPY, PRINT, DELTREE
- 3.7. Explain directories and files
- 3.8. Know wild card characters
- 3.9. Describe Autoexec.bat and config.sys files

4.0 Understand Windows Operating Systems

- 4.1. List the features of Windows desktop.
- 4.2. List the components of a Window.
- 4.3. State the function of each component of a Window.
- 4.4. Explain the Method of starting a program using start button
- 4.5. Explain usage of maximize, minimize, restore down and close buttons.
- 4.6. State the meaning of a file.
- 4.7. State the meaning of a folder.
- 4.8. Explain the Method of viewing the contents of hard disk drive using Explorer
- 4.9. Explain the Method of finding a file using search option.
- 4.10. Explain the procedure for changing resolution, color, appearance, screensaver options of the display
- 4.11. Narrate the process of changing the system date and time

5.0 Features of Word Processing

- 5.1. Features of MS-Word
- 5.2. Know the user interface – File Menu, using Quick Access toolbar, using the Ribbon, getting help
- 5.3. Narrate the process of copying, cutting & pasting text within the same file
- 5.4. Word processor basics, text wrapping, adding or deleting text, selecting blocks of text, copying text, moving text, search & replace, editing a document.
- 5.5. Character formatting & style, page formatting, margin setting & columns, justification of text, line spacing, setting tabs, automatic tasks, creating letters in readymade format.
- 5.6. Page setting, Previewing the document & printing the document
- 5.7. Describe the process of including the headers & footers.
- 5.8. Explain creation of table, insertion & deletion of rows & columns.
- 5.9. Sorting table, applying formulas in a table, converting text to table.
- 5.10. Open an existing document, spell check, setting the numbers in the documents.
- 5.11. Describe mail merge.
- 5.12. Import & export from & to various formats.

6.0 Features of Excel

- 6.1. Use of spread sheets
- 6.2. Inserting cells, rows, columns & worksheets
- 6.3. Explain changing column width & row height.
- 6.4. Explain entering, editing using formulae.
- 6.5. Common Functions – SUM, AVG, MIN, COUNT, IF, UPPER, LOWER etc..
- 6.6. Relative & Absolute addressing
- 6.7. Excel page setting features
- 6.8. Describe the process of working with multiple worksheets.
- 6.9. Explain the concept of a function in excel
- 6.10. Explain function wizard.
- 6.11. Describe creating & editing charts
- 6.12. Describe creating & placing graphic objects.

7.0 Features of Power Point Presentation

- 7.1. List the readymade slide layout schemes available in the software
- 7.2. Describe creating slides for each of slide layout schemes
- 7.3. Explain entering & editing text
- 7.4. Explain inserting picture

- 7.5. Describe changing the background of the slide
- 7.6. Describe creating text & picture animating in the slide
- 7.7. Describe creating slide transition effects.

8.0 Features of MS-Access

- 8.1. Describe the data types used and their properties
- 8.2. Creation of a table
- 8.3. Explain adding, deleting and renaming fields
- 8.4. Explain the purpose of primary key.
- 8.5. Explain the process of entering and editing data.
- 8.6. Explain the process of saving & modifying forms
- 8.7. Explain creating & editing using queries.
- 8.8. Explain the process of sorting data
- 8.9. Hiding a field, setting & deleting criteria.
- 8.10. Describe displaying data
- 8.11. Creating forms & reports
- 8.12. Describe the process of printing reports and forms.

9.0 Understand Features of Internet

- 9.1. Explain meaning of a computer network.
- 9.2. Describe the concept of a LAN, WAN, MAN.
- 9.3. Compare Internet and Intranet
- 9.4. Describe the relevance of an internet service provider.
- 9.5. Explain the role of a modem in accessing the Internet.
- 9.6. Explain the purpose of web browser software.
- 9.7. Explain the structure of a Universal Resource Locator (URL).
- 9.8. Browsing the internet , searching for acontent using various search engines
- 9.9. Explain the process of sending and receiving E-mail
- 9.10. Explain the use of Antivirus software

COURSE CONTENTS

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

2.0 Number system

Binary Number system, 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.

3.0 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

4.0 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 folder -Viewing the contents of hard disk drive using explorer -Finding a file - Changing resolution, colour, appearance and screensaver options of the display - Changing the system date and time.

5.0 Features of Word – processing

Word basics – menus - formatting text & documents – working with headers, footers & footnotes, tabs – working with tables & sorting –spelling & grammar checking – mail merge features – importing & exporting.

6.0 Features of Excel

Excel basics – rearranging worksheet, formatting features – introduction to function & formulae – charts & graphs

7.0 Features of Power Point Presentation

Powerpoint basics – creation of slides – text animation – slide transition features – inserting picture, sound & background.

8.0 Features of MS-Access

Access Basics – creating simple databases & forms – entering and editing data, finding sorting & displaying data – printing reports.

9.0 Features of Internet

Computer network -LAN- WAN - MAN - Internet & Intranet - Internet service provider- Role of a modem in accessing the Internet- Web browser software - URL - Sending and receiving E-mail – antivirus software

REFERENCE BOOKS

1. Microsoft office 2007 for dummies - Wallace Wang
2. Computer Science Theory & Application - E. Balaguruswamy, B. Sushila
3. Introduction to Computers (Special Indian Edition) - Peter Norton

PROGRAMMING IN C
(Common with Information Technology)

Subject : Programming in C
Subject Code : CM- 106 / IT-106
Periods per Week : 5
Periods per Year : 150

TIME SCHEDULE AND BLUE PRINT										
Unit No	Major Topic	No of Periods		Weightage of marks	Short Type			Essay Type		
		Theory	Practice		R	U	App	R	U	App
1	Programming Methodology	6	6							
	Algorithms	3	3	9	0	0	1	0	0	½
	Flow Charts	3	3		0	0	1	0	0	
2	Introduction to C Language	4	0	2	1	0	0	0	0	0
3	Constants, Variables and Data Types in C	5	1	4	1	0	1	0	0	0
4	Operators and Expressions in C	6	6	5	0	0	0	0	0	½
5	Managing Input and Output Operations	4	2	2	0	1	0	0	0	0
6	Decision making	6	8	14	0	1	1	0	0	1
7	Looping concepts	6	8	14	0	1	1	0	0	1
8	Arrays	6	10	14	0	1	1	0	0	1
9	Strings	4	4	4	0	1	1	0	0	0
10	User defined functions	24		21	3			1½		
	Functions	10	10	14	1	0	1	0	1	0
	Scope , visibility and lifetime	4	0	7	0	1	0	½	0	0
11	Basics of Pointers	4	8	12	0	1	0	0	1	0
12	Basics of Structures and Unions	6	4	5	0	0	0	0	½	0
13	Basics of Files management and Preprocessor directives	12		14	2			1		
	File management	6	3	12	0	1	0	0	1	0
	Preprocessor directives	2	1	2	1	0	0	0	0	0
	Total	79	71	120	4	8	8	½	3½	4

Objectives:

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

1.0 Programming Methodology.

- 1.1. State the different steps involved in problem solving.
- 1.2. Define algorithm.
- 1.3. List four characteristics of algorithm.
- 1.4. Define a program
- 1.5. Differentiate between program and algorithm.
- 1.6. State the steps involved in algorithm development.
- 1.7. Differentiate algorithm and flowchart.
- 1.8. Develop algorithms for simple problems.
- 1.9. Draw the symbols used in flowcharts.
- 1.10. Draw flowcharts for simple problems.

2.0 Introduction to C Language

- 2.1 Define High level language and low level language
- 2.2 Describe the history of C language
- 2.3 State the importance of C language
- 2.4 Define & Differentiate Compiler, Assembler.
- 2.5 Explain the structure of C language
- 2.6 Describe the programming style of C language
- 2.7 Explain the steps involved in executing the C program

3.0 Understand Constants, Variables and Data Types in C

- 3.1 Describe character set.
- 3.2 Explain C Tokens
- 3.3 Describe Keywords and Identifiers
- 3.4 Explain Constants and Variables
- 3.5 Define Data type
- 3.6 Classify data types and explain them with examples.
- 3.7 Explain declaration of a variable
- 3.8 Explain assigning values to variables

4.0 Understand Operators and Expressions in C

- 4.1 Define an operator
- 4.2 Define an expression
- 4.3 Classify operators
- 4.4 Explain various arithmetic operators with examples
- 4.5 Illustrate the concept of relational operators
- 4.6 Explain logical operators
- 4.7 Describe various assignment operators
- 4.8 Illustrate nested assignment
- 4.9 Describe increment and decrement operators
- 4.10 Illustrate conditional operator
- 4.11 Explain bitwise operators
- 4.12 Explain special operators
- 4.13 Illustrate arithmetic expressions
- 4.14 Describe precedence and associativity of operators
- 4.15 Describe evaluation of expressions
- 4.16 Illustrate type conversion techniques and discuss them

5.0 Understand Input and Output Operations

- 5.1 Illustrate reading a character using getchar()
- 5.2 Illustrate writing a character using putchar()
- 5.3 Illustrate formatted input using scanf()
- 5.4 Write sample programs for formatted input using scanf()
- 5.5 Describe formatted output with example programs
- 5.6 Write sample programs for formatted output using printf()
- 5.7 Illustrate Preprocessor Directive #include

6.0 Understand Decision making

- 6.1 Discuss decision making in programming
- 6.2 Explain decision making statements
- 6.3 Describe relational operators with their precedence
- 6.4 Explain logical operators and their precedence
- 6.5 Explain how to evaluate a logical expression.
- 6.6 Discuss about simple if statement with syntax and sample program
- 6.7 Discuss about nested if..else statements with syntax and sample program
- 6.8 Discuss about else if ladder with syntax and sample program
- 6.9 State the importance of indentation
- 6.10 Discuss about switch statement with syntax and sample program
- 6.11 Illustrate conditional operator

7.0 Understand Looping concepts

- 7.1 Define looping
- 7.2 List loop statements
- 7.3 Explain while statement with syntax and sample program
- 7.4 Explain do- while statement with syntax and sample program
- 7.5 Explain 'for' loop statement with syntax and sample program
- 7.6 Define nesting of loops and implement it
- 7.7 Compare different loop statements
- 7.8 Differentiate break and continue statements.
- 7.9 Define structured programming

8.0 Understand Arrays

- 8.1 Define Array
- 8.2 Describe declaration and initialization of One Dimensional Array with syntax and sample program
- 8.3 Explain accessing the elements in the Array with sample program
- 8.4 Explain reordering an array in ascending order
- 8.5 Explain declaration and initialization of two Dimensional Arrays.
- 8.6 Illustrate the concept of arrays with sample programs on matrix addition and matrix multiplication

9.0 Understand Strings

- 9.1 Define String
- 9.2 Know about declaration and initialization of a String variable.
- 9.3 Know about reading of strings from terminal with sample program
- 9.4 Know about writing strings to screen with sample program
- 9.5 Explain about various String handling functions with sample programs.
- 9.6 Explain Arithmetic operations on Characters

10.0 Understand User defined functions

- 10.1 Define function.
- 10.2 State the need for user defined functions
- 10.3 Discuss the advantages of functions
- 10.4 Discuss the elements of function
- 10.5 Discuss about return values and their types
- 10.6 Define a function call
- 10.7 Define function prototype
- 10.8 Illustrate function declaration in programs
- 10.9 Discuss and illustrate functions with no arguments and no return values with sample programs
- 10.10 Discuss and illustrate functions with arguments with no return values with sample programs
- 10.11 Discuss and illustrate functions with arguments with return values with sample programs
- 10.12 Discuss and illustrate functions with no arguments with return values with sample programs
- 10.13 Illustrate functions that return multiple values with sample programs
- 10.14 Define recursion
- 10.15 Illustrate recursion with sample programs
- 10.16 Illustrate passing arrays to functions with sample programs
- 10.17 Discuss the scope, visibility and lifetime of variables in functions
- 10.18 Differentiate Local and External variables
- 10.19 Define Global variable
- 10.20 Discuss passing the global variables as parameters using sample programs

11.0 Understand basics of Pointers

- 11.1 Define Pointer
- 11.2 Illustrate declaration and initialization of Pointers.
- 11.3 Illustrate accessing the address of a variable using & operator
- 11.4 Illustrate accessing a value of a variable through pointer
- 11.5 Differentiate between address and de-referencing operators.
- 11.6 Discuss about pointer arithmetic.
- 11.7 Illustrate precedence of address and de-referencing operators.
- 11.8 Discuss on pointer comparison and pointer conversion.
- 11.9 Illustrate relationship between arrays and pointers.
- 11.10 Illustrate accessing array elements using pointers
- 11.11 Illustrate use of pointers as function arguments
- 11.12 Discuss pointer arrays with examples.
- 11.13 Explain dynamic memory management functions and illustrate with examples to use these functions.

12.0 Understand basics of Structures and Unions

- 12.1 Define a structure.
- 12.2 Illustrate creating a structure
- 12.3 Illustrate declaring structure variables
- 12.4 Explain accessing of the structure members
- 12.5 Explain array of structures
- 12.6 Illustrate concept of structure assignment.
- 12.7 Explain how to find size of a structure.
- 12.8 Discuss nested structure concept.
- 12.9 Illustrate use of pointer to structure.

- 12.10 Illustrate structure as function arguments and structures as function values.
- 12.11 Illustrate the Structures containing arrays, arrays of structures containing arrays
- 12.12 Illustrate concept of structures containing pointers.
- 12.13 Explain Self referential structures with examples.
- 12.14 Define Union and illustrate use of a union.
- 12.15 Differences between Structures and Union

13.0 Understand basics of Filemanagement and Preprocessor directives

- 13.1 Define file
- 13.2 Know how to declare file pointer to a file
- 13.3 Illustrate the concept of file opening in various modes
- 13.4 Illustrate the concept of closing of a file
- 13.5 Illustrate the concept of Input / Output operations on a file
- 13.6 Illustrate the concept of random access to files
- 13.7 State the need of Preprocessor directives
- 13.8 Explain Preprocessor directives
- 13.9 Explain macro substitution using #define with an example

COURSE CONTENTS:

1. 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.

2. Introduction to C Language

Define High level language and low level language-history of C language - importance of C language – Define & Differentiate Compiler, Assembler - structure of C language - programming style of C language - steps involved in executing the C program

3. 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

4. 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.

5. Managing Input and Output Operations

Reading and writing characters - formatted input and output -Preprocessor Directive #include

6. 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

7. Understand Looping concepts

Classification of various loop statements- while statement – do-while statement - for loop statement - nesting of loops- Comparisons of different loop statements - break and continue statements - structured programming

8. 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

9. Understand Strings

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

10. 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

11. 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

12. 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

13. 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. Let Us C | YeshwanthKanetkar | BPB Publications |
| 2. Programming in ANSI C | E. Balaguruswamy | Tata McGrawHill |
| 3. Programming with C | Gottfried | Schaum' outline |
| 4. C The complete Reference | Schildt | Tata McGraw Hill |

ENGINEERING DRAWING

Subject Title : **Engineering Drawing**

Subject Code : M-107

Periods/Week : **06**

Periods Per Year : **180**

TIME SCHEDULE

S.No	Major Topics	Minimum No. of Drawing plates	Periods	Weightage of Marks	Short Answer Questions	Essay type Questions
1	Importance of Engineering Drawing	--	01	-	-	-
2	Engineering Drawing Instruments	01	05	-	-	-
3	Free hand lettering & Numbering	01	06	5	1	-
4	Dimensioning Practice	01	09	5	1	-
5	Geometrical constructions	05	21	15	1	1
6	Projection of points, Lines, Planes & Solids	03	21	10	-	1
7	Auxiliary views	02	06	5	1	-
8	Sectional views	02	21	10	-	1
9	Orthographic Projection	04	36	10	-	1
10	Pictorial drawing	02	30	10	-	1
11	Development of surfaces	03	24	10	-	1
Total		24	180	80	04	06

NOTE: The numbers of plates mentioned above are minimum. The actual number may be increased based on the need

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

Pre-Requisite: Clear visualization and sound pictorial intelligence

OBJECTIVES

Upon completion of the subject the student shall be able to

1.0 Understand the basic concepts of Engineering Drawing

- 1.1 State the importance of drawing as an engineering communication medium
- 1.2 State the necessity of B.I.S. Code of practice for Engineering Drawing.
- 1.3 Explain the linkages between Engineering drawing and other subjects of

study in diploma course.

2.0 Use of Engineering Drawing Instruments

- 2.1 Select the correct instruments and draw lines of different orientation.
- 2.2 Select the correct instruments and draw small and large Circles.
- 2.3 Select the correct instruments for measuring distances on the drawing.
- 2.4 Use correct grade of pencil for different types of lines, thickness and given function.
- 2.5 Select and use appropriate scales for a given application.
- 2.6 Identify different drawing sheet sizes as per I.S. and Standard Lay- outs.
- 2.7 Prepare Title block as per B.I.S. Specifications.
- 2.8 Identify the steps to be taken to keep the drawing clean and tidy.

Drawing Plate 1: (02 exercises)

3.0 Write Free Hand Lettering and Numbers

- 3.1 Write titles using inclined lettering and numerals of 7mm, 10mm and 14mm height
- 3.2 Write titles using vertical lettering and numerals of 7mm, 10mm and 14mm height
- 3.3 Select suitable sizes of lettering for different layouts and applications
- 3.4 Practice the use of lettering stencils.

Drawing plate 2: (6 exercises)

4.0 Understand Dimensioning Practice

- 4.1 Define "Dimensioning.
- 4.2 State the need of dimensioning the drawing according to accepted standard.
- 4.3 Identify notations of Dimensioning used in dimensioned drawing.
- 4.4 Identify the system of placement of dimensions in the given dimensioned drawing.
- 4.5 Dimension a given drawing using standard notations and desired system of dimensioning.
- 4.6 Dimension standard features applying necessary rules.
- 4.7 Arrange dimensions in a desired method given in a drawing.
- 4.8 Identify the deviations if any made in the given dimensioned drawing with reference to SP-46-1988, and dimension the same correctly.

Drawing Plate 3: (10 exercises)

5.0 Apply Principles of Geometric Constructions

- 5.1 Divide a given line into desired number of equal parts internally.
- 5.2 Draw tangent lines and arcs.
- 5.3 Use General method to construct any polygon.
- 5.4 Explain the importance of conics
- 5.5 Construct conics (ellipse, parabola and hyperbola) by general method
- 5.6 Construct ellipse by concentric circles method
- 5.7 Construct parabola by rectangle method
- 5.8 Construct rectangular hyperbola from the given data.
- 5.9 Construct involute from the given data.
- 5.10 Construct cycloid and helix from the given data.
- 5.11 State the applications of the above constructions in engineering practice.

Drawing Plate -4: Problems up to construction Tangents and Arcs

Drawing Plate -5: problems on construction of polygon

Drawing Plate -6: problems on construction of conics

Drawing Plate -7 & 8: Problems on construction of involute, cycloid and helix

6.0 Apply Principles of Projection of points, lines, planes & solids

- 6.1 Visualize the objects
- 6.2 Explain the First angle and Third angle projections
- 6.3 Practice the First angle projections
- 6.4 Draw the projection of a point with respect to reference planes (HP&VP)
- 6.5 Draw the projections of straight lines with respect to two reference Planes (up to lines parallel to one plane and inclined to other plane)
- 6.6 Draw the projections of planes (up to planes perpendicular to one plane and inclined to other plane)
- 6.7 Draw the projections of solids (up to axis of solids parallel to one plane and inclined to other plane)

Drawing Plate -9: Problems up to projection of points and Lines (15 exercises)

Drawing Plate -10: Problems of projection of planes (6 exercises)

Drawing Plate -11: Problems of projection of solids (10 exercises)

7.0 Understand the need of auxiliary views

- 7.1 State the need of Auxiliary views for a given engineering drawing.
- 7.2 Draw the auxiliary views of a given engineering component
- 7.3 Differentiate between auxiliary view and apparent view

Drawing plate No.12 &13: (10 exercises)

8.0 Appreciate the need of Sectional Views

- 8.1 Explain the need to draw sectional views.
- 8.2 Select the section plane for a given component to reveal maximum information.
- 8.3 Explain the positions of section plane with reference planes
- 8.4 Differentiate between true shape and apparent shape of section
- 8.5 Draw sectional views and true sections of regular solids discussed in 6.0
- 8.6 Apply principles of hatching.

Drawing Plate-14 & 15: (6 exercises)

9.0 Apply principles of orthographic projection

- 9.1 Explain the principles of orthographic projection with simple sketches.
- 9.2 Draw the orthographic view of an object from its pictorial drawing.
- 9.3 Draw the minimum number of views needed to represent a given object fully.

Drawing Plate 16,17,18&19 : (16 exercises)

10.0 Prepare pictorial drawings

- 10.1 State the need of pictorial drawings.
- 10.2 Differentiate between isometric scale and true scale.
- 10.3 Prepare Isometric views for the given orthographic drawings.

Drawing plate 20 & 21: (12 exercises)

11.0 Interpret Development of surfaces of different solids

- 11.1 State the need for preparation of development of surfaces and solids..
- 11.2 Prepare development of simple engineering objects(cubes, prisms, cylinders, cones, pyramid) using parallel line and radial line method.
- 11.3 Prepare development of surface of engineering components like trays, funnel, 90⁰ elbow & rectangular duct.

Drawing plate No. 22,23&24 : (10 exercises)

Key competencies to be achieved by the student

S.No	Major topic	Key Competency
1.	Importance of Engineering Drawing	<ul style="list-style-type: none"> Explain the linkages between Engineering drawing and other subjects of study in Diploma course.
2.	Engineering Drawing Instruments	<ul style="list-style-type: none"> Select the correct instruments to draw various entities in different orientation
3.	Free hand lettering & Numbering	<ul style="list-style-type: none"> Write titles using inclined and vertical lettering and numerals as per B.I.S (Bureau of Indian standards)
4.	Dimensioning Practice	<ul style="list-style-type: none"> Dimension a given drawing using standard notations and desired system of dimensioning
5.	Geometrical construction	<ul style="list-style-type: none"> Construct ellipse, parabola, rectangular hyperbola, involute, cycloid and helix from the given data.
6.	Projection of points, Lines, Planes & Solids	<ul style="list-style-type: none"> Draw the projection of a point, straight lines, planes & solids with respect to reference planes (HP& VP)
7.	Auxiliary views	<ul style="list-style-type: none"> Draw the auxiliary views of a given Engineering component Differentiate between Auxiliary view and apparent view
8.	Sectional views	<ul style="list-style-type: none"> Differentiate between true shape and apparent shape of section Use conventional representation of Engineering materials as per B.I.S. Code. Apply principles of hatching. Draw simple sections of regular solids
9.	Orthographic Projection	<ul style="list-style-type: none"> Draw the minimum number of views needed to represent a given object fully.
10.	Pictorial drawing	<ul style="list-style-type: none"> Differentiate between isometric scale and true scale. Draw the isometric views of given objects,.
11.	Development of surfaces	<ul style="list-style-type: none"> Prepare development of Surface of Engineering components like trays, funnel, 90⁰ elbow & rectangular duct.

COURSE CONTENT

NOTE

1. **B.I.S Specification should invariably be followed in all the topics.**
2. **A-3 Size Drawing Sheets are to be used for all Drawing Practice Exercises.**

1.0 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.

2.0 Engineering drawing Instruments

Classifications: Basic Tools, tools for drawing straight lines, tools for curved lines, tools for measuring distances and special tools like mini drafter & drafting machine – Mentioning of names under each classification and their brief description -Scales: Recommended scales reduced & enlarged -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:

Lay out of sheet – as per SP-46-1988 to a suitable scale.

Simple Exercises on the use of Drawing Instruments. Importance of Title

Block.

3.0 Free hand lettering & numbering

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

4.0 Dimensioning practice

Purpose of engineering Drawing, Need of B.I.S code in dimensioning -Shape description of an Engineering object -Definition of Dimensioning size description -Location of 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 of Circles (holes) arcs, angles, tapers, chamfers and dimension of narrow spaces.

5.0 Geometric Constructions

Division of a line: to divide a straight line into given number of equal parts Examples in engineering application.

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 touching 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 length using

general method

Conics: Explanation of Ellipse, Parabola, Hyperbola, as sections of a cone and loci of a moving point, Eccentricity of above curves – Their Engg.application viz. Projectiles, reflectors, P-V Diagram of a Hyperbolic process,

Construction of any conic section of given eccentricity by general method

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 application, viz, Gear tooth profile, screw threads, springs etc. - their construction

6.0 Projection of points, lines and planes & solids

Projecting a point on two planes of projection -Projecting a point on three planes of projection -Projection of straight line.

- (a) Parallel to both the planes.
- (b) Perpendicular to one of the planes.
- (c) inclined to one plane and parallel to other planes

Projection of regular planes

- (a) Plane perpendicular to HP and parallel to VP and vice versa.
- (c) Plane perpendicular to HP and inclined to VP and vice versa.

Projection of regular solids

- (a) Axis perpendicular to one of the planes
- (b) Axis parallel to VP and inclined to HP and vice versa.

7.0 Auxiliary views

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

8.0 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

9.0 Orthographic Projections

Meaning of orthographic projection -Using a viewing box and a 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 a number of engg 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 miter 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.

10.0 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

11.0 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 and parallel to the other -Development of simple solids like cubes, prisms, cylinders, cones, pyramid (sketches only) -Types of development: Parallel line and radial line development -Procedure of drawing development, drawings of trays, funnels, 90⁰ elbow pipes and rectangular ducts.

REFERENCE BOOKS

Engineering Graphics by P I Varghese – (McGraw-hill)
Engineering Drawing by BasantAgarwal& 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 LAB PRACTICE

(Common With Information Technology)

Subject Title : C Programming Lab Practice
Subject Code : CM- 108 / 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 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

CM-108/ IT - 108 : C PROGRAMMING LAB**OBJECTIVES AND KEY COMPETENCIES**

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	<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ 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 while loop ❖ Differentiate for and while statements
16	Exercise on do statement	Write a C program using do statement	<ul style="list-style-type: none"> ❖ 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 and for statements
17	Exercise on one dimensional arrays	Write a C program to create and access one dimensional array	<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ 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

			<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ Identify the different parts of function declaration ❖ Define function with correct syntax ❖ Classify functions based on its 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	<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ 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	<ul style="list-style-type: none"> ❖ 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 LAB
(Common for all branches)

SubjectTitle : **Physics Lab**
SubjectCode : **Common-109**
Periodsperweek : **03**
Totalperiodsperyear : **45**

TIMESCHEDULE

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 Practice the Vernier caliper to determine the volume of a cylinder and sphere
- 2.0 Practice the Screw gauge to determine thickness of a glass plate and cross section of a wire
- 3.0 Verify the parallelogram law and Triangle law of forces.
- 4.0 Determine the value of acceleration due to gravity using Simple Pendulum and verify with L-T² graph.
- 5.0 Determine the velocity of sound in air at room temperature
- 6.0 Determine the Focal length and focal power of convex lenses using U-V and graphical method
- 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 wire material using Meter Bridge
- 12.0 Practice the mapping of magnetic lines of force

Competencies and Key competencies to be achieved by the student

Name of the Experiment (No of Periods)	Competencies	Key competencies
1. Hands on practice on Vernier Calipers(03)	<ul style="list-style-type: none"> • Find the Least count • Fix the specimen in posit • Read the scales • Calculate the volume of given object 	<ul style="list-style-type: none"> • Read the scales • Calculate the volume of given object
2. Hands on practice on Screw gauge(03)	<ul style="list-style-type: none"> • Find the Least count • Fix the specimen in posit • Read the scales • Calculate thickness of glass place and cross section of wire 	<ul style="list-style-type: none"> • Read the scales • Calculate thickness of given glass plate • Calculate cross section of wire
3. Verification of Parallelogram law of forces and Triangle law of forces(03)	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Find the angle at equilibrium point • Constructing parallelogram • Construct triangle • Compare the ratios of force and length
4. Simple pendulum(03)	<ul style="list-style-type: none"> • Fix the simple pendulum to the stand • Adjust the length of pendulum • Find the time for number of oscillations • Find the time period • Calculate the acceleration due to gravity • Draw I-T and I-T² graph 	<ul style="list-style-type: none"> • Find the time for number of oscillations • Find the time period • Calculate the acceleration due to gravity • Draw I-T and I-T² graph
5. Velocity of sound in air –Resonance method(03)	<ul style="list-style-type: none"> • Arrange the resonance apparatus • Adjust the reservoir level for booming sound • Find the first and second resonating lengths • Calculate velocity of sound 	<ul style="list-style-type: none"> • Adjust the reservoir level • Find the first and second resonating lengths • Calculate velocity of sound • Calculate velocity of sound at 0⁰ C

<p>6. Focal length and Focal power of convex lens (Separate & Combination) (03)</p>	<ul style="list-style-type: none"> • Fix the object distance • Find the Image distance • Calculate the focal length and power of convex lens and combination of convex lenses • Draw u-v and $1/u - 1/v$ curves 	<ul style="list-style-type: none"> • Calculate the focal length and power of convex lens • Draw u-v and $1/u - 1/v$ graph
<p>7. Refractive index of solid using traveling microscope(03)</p>	<ul style="list-style-type: none"> • Find the least count of vernier on microscope • Place the graph paper below microscope • Read the scale • Calculate the refractive index of glass slab 	<ul style="list-style-type: none"> • Read the scale • Calculate the refractive index of glass slab
<p>8. Surface tension of liquid using traveling microscope(03)</p>	<ul style="list-style-type: none"> • 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 tension of water 	<ul style="list-style-type: none"> • Read the scale • Calculate height of liquid rise • Calculate the surface tension of water
<p>9. Coefficient of viscosity by capillary method(03)</p>	<ul style="list-style-type: none"> • Find the least count of vernier • Fix the capillary tube to aspiratory bottle • Find the mass of collected water • Find the pressure head • Calculate rate of volume of liquid collected • Find the radius of capillary tube • Calculate the viscosity of water using capillary method 	<ul style="list-style-type: none"> • Find the pressure head • Calculate rate of volume of liquid collected • Find the radius of capillary tube • Calculate the viscosity of water

Name of the Experiment	Competencies	Key competencies
10. Boyle's law verification (03)	<ul style="list-style-type: none"> • 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 $P \times l$ 	<ul style="list-style-type: none"> • Find the length of air column • Find the pressure of enclosed air • Find the value $P \times l$
11. Meter bridge(03)	<ul style="list-style-type: none"> • Make the circuit connections • Find the balancing length • Calculate unknown resistance • Find the radius of wire • Calculate the specific resistance 	<ul style="list-style-type: none"> • Find the balancing length • Calculate unknown resistance • Calculate the specific resistance
12. Mapping of magnet lines of force(03)	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Draw magnetic lines of force • Locate the neutral points along equatorial and axial lines

CHEMISTRY LAB

SubjectTitle : **Chemistry Lab**
SubjectCode : **CM-110**
Periodsperweek : **03**
Totalperiodsperyear : **45**
Curriculum : **C-16**

TIMESCHEDULE

S.N	Name of the Experiment	No.ofPeriods
1.	Familiarization of methods for Volumetricanalysis	03
2.	Preparation of StdNa ₂ CO ₃ solution and making solutions of different dilution	03
3.	EstimationofHCl solution usingStd. Na ₂ CO ₃ solution	03
4.	EstimationofNaOHusingStd.HCl solution	03
5.	Estimationof H ₂ SO ₄ usingStd.NaOH solution	03
6.	EstimationofMohr'sSalt usingStd.KMnO ₄	03
7.	Determinationofacidityofwatersample	03
8.	Determinationofalkalinityofwatersample	03
9.	DeterminationoftotalhardnessofwaterusingStd.EDTAsolution	03
10.	EstimationofChloridespresentinwatersample	03
11.	EstimationofDissolvedOxygen(D.O)inwatersample	03
12.	DeterminationofpHusingpHmeter	03
13.	Revision	06
14	Practice Test	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 making dilutions, etc.
- 2.0 Practice making standard solutions with pre weighted salts and to make desired dilutions using appropriate techniques.
- 3.0 Conduct titrations adopting standard procedures and using Std. Na₂CO₃solution 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 H₂SO₄
- 6.0 Conduct titrations adopting standard procedures and using Std. KMnO₄solution for estimation of Mohr'sSalt
- 7.0 Conduct titrations adopting standard procedures to determine the acidity of given samples of water (ground water and surface / tap water, and rain water if available)
- 8.0 Conduct titrations adopting standard procedures to determine the alkalinity of given samples of water (ground water and surface / tap water)

- 9.0 Conduct titrations adopting standard procedures to determine the total hardness of given samples of water (ground water and 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 waste water (ground water and 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 Revision
- 14.0 To conduct Test.

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 different diluted solution (03)	<ul style="list-style-type: none"> ▪ Weighting the salt to the accuracy of 0.001g ▪ Measuring the water with volumetric flask, measuring jar, volumetric pipette and graduated pipette ▪ Making appropriate dilutions 	<ul style="list-style-type: none"> ▪ Weighting the salt to the accuracy of 0.001g ▪ Measuring the water with volumetric flask, measuring jar, volumetric pipette and graduated pipette ▪ Making appropriate
Name of the Experiment (No of Periods)	Competencies	Key competencies
Estimation of HCl solution using Std. Na_2CO_3 solution (03)	<ul style="list-style-type: none"> ▪ 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 	<ul style="list-style-type: none"> ▪ 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)	<ul style="list-style-type: none"> ▪ Identifying the end point ▪ Making accurate observations ▪ Calculating the results 	
Estimation of Dissolved Oxygen (D.O) in water sample (By titration method) (03)		
	<ul style="list-style-type: none"> ▪ 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 	<ul style="list-style-type: none"> ▪ 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)		
Name of the Experiment (No of Periods)	Competencies	Key competencies
Revision (06) Practice Test (03)		<ul style="list-style-type: none"> ▪ To prepare the student for practical examination

COMPUTER FUNDAMENTALS & OFFICE AUTOMATION LAB
(Common with Information Technology)

Subject Title : **Computer Fundamentals Lab**
Subject Code : **CM-111/ IT - 111**
Periods/Week : **3**
Periods/Semester : **90**

LIST OF EXPERIMENTS:

1.0 BASICS

- 1.1. Identify the various components of a Computer system
- 1.2. Differentiate between hardware and software
- 1.3. State the configuration of a computer system
- 1.4. Exercise on creation of Text Files using Notepad, WordPad
- 1.5. Exercise on creation of .jpeg, .bmp Files using MS Paint
- 1.6. Exercise how to use calculator

2.0 DOS

- 2.1. Practice on Internal and External commands.
- 2.2. Create and use Batch Files.
- 2.3. Know the usage of Editors.

3.0 WINDOWS

- 3.1. Exercise on creation of folders and organizing files in different folders
- 3.2. Exercise on use of Recycle Bin
- 3.3. Exercise on use of My Computer and My Documents
- 3.4. Exercise on creation of shortcut to files and folders (in other folders) on Desktop
- 3.5. Exercise on arranging of icons – name wise, size, type, Modified
- 3.6. Exercise on searching of files and folders
- 3.7. Exercise on using of explorer for accessing of files and folders
- 3.8. Exercise on organizing files / folders using copy and paste of files and folders
- 3.9. Change resolution, color, appearance, screen server options of Display
- 3.10. Change the system date and time.

4.0 MS-WORD

- 4.1. Open MS-word and Identify the components on the screen
- 4.2. Create a document using MS-word and save it.
- 4.3. Create a table using MS-Word and save it.
- 4.4. Apply formulas in table & sort the table
- 4.5. Convert text into table & table into text.
- 4.6. Insertion of new rows and columns in the existing table and changing background color in Table
- 4.7. Merging and splitting of cells in a Table
- 4.8. Changing the formatting of font
- 4.9. Exercise with Headers and Footers, paragraph tool bar
- 4.10. Insert objects into the document like pictures, shapes, charts, wordart.
- 4.11. Create mailing letters using mail merge tool of MS-word
- 4.12. Printing a document , page setting, different views of a document
- 4.13. Import & export files to & from Word.

5.0 MS-EXCEL

- 5.1. Open MS-Excel and identify the components on the screen
- 5.2. Create a Worksheet in MS-Excel and save it in .xls or .xlsx format
- 5.3. Inserting column and row in Excel
- 5.4. Creation of new worksheet in the existing Excel Book file
- 5.5. Generate a Chart using the data in Excel-worksheet
- 5.6. Automate calculations in a worksheet using formula
- 5.7. Sort and filter data in a worksheet
- 5.8. Protecting a worksheet, working with multiple sheets

6.0 MS-POWERPOINT

- 6.1. Create a simple Power point presentation for a small topic and saving in .ppt or pptx format
- 6.2. Inserting a new slide in the existing powerpoint file
- 6.3. Inserting chart or image in a powerpoint slide
- 6.4. Exercise with animation and sound features in powerpoint
- 6.5. Exercise with Rehearse Timings feature in powerpoint
- 6.6. Exercise in printing the powerpoint file in (a) Slides (b) Handouts

7.0 MS-ACCESS

- 7.1. Create a table for given data and save in .mdb or .accdb format
- 7.2. Add,Delete and rename fields
- 7.3. Use the Primary key field
- 7.4. Enter and edit data
- 7.5. Use Relationships option
- 7.6. Create forms
- 7.7. Modify and save forms
- 7.8. Create and use queries
- 7.9. Sort data
- 7.10. Display data
- 7.11. Create and print reports






















8.0 INTERNET

- 8.1 Create an e-mail account
- 8.2 Compose& send an email.
- 8.3 Exercise how to open the received mail.
- 8.4 Browse the internet using various search engines.





















CM-111 / IT - 111 COMPUTER FUNDAMENTALS LAB





















OBJECTIVES AND KEY COMPETENCIES

S N O	Name of Experiments	Objectives	Key Competencies
1.	Identify the various components of a Computer system	<ul style="list-style-type: none"> 🔧 Identify various Components of a System 	<ul style="list-style-type: none"> ❖ Check whether components are identified correctly ❖ Identify all components inside computer ❖ Identify all Peripherals connected ❖ Observe the functionality of all components like CPU, RAM, HDD, FDD, Motherboard
2.	Differentiate between hardware and software	<ul style="list-style-type: none"> 🔧 To Differentiate between hardware and software 	<ul style="list-style-type: none"> ❖ Observe differences between hardware and software
3.	State the configuration of a computer system	<ul style="list-style-type: none"> 🔧 Able to observe configuration of given system 	<ul style="list-style-type: none"> ❖ Use System icon in control panel ❖ Use system information in Accessories
4.	Exercise on creation of .jpeg, .bmp Files using MS Paint	<ul style="list-style-type: none"> 🔧 Able to create picture file in .jpeg format 🔧 Able to create picture file in .bmp format 	<ul style="list-style-type: none"> ❖ Check whether able to create picture file .jpeg format properly ❖ Check whether able to create picture file in .bmp format properly
5.	Practice on Internal and External commands.	<ul style="list-style-type: none"> 🔧 To use internal commands 🔧 To use External commands 	<ul style="list-style-type: none"> ❖ Check whether able to use all internal commands using DOS ❖ Check whether able to use all external commands using DOS

6.	Create and use Batch Files.	<ul style="list-style-type: none">  Able to create Batch files  Able to create Autoexe.bat file 	<ul style="list-style-type: none"> ❖ Check whether able to create by taking set files in creating batch file ❖ Check whether able to create AUtoexe.bat file properly
7.	Know the usage of Edline Editor	<ul style="list-style-type: none">  Able to use edline command to create a file  Able to edit a file using edline command 	<ul style="list-style-type: none"> ❖ Check whether able to use edline command in DOS environment ❖ Check whether able to edit a file using edline command
8.	Exercise on creation of folders and organizing files in different folders	<ul style="list-style-type: none">  Able to create folder  Able to organize file in different folders 	<ul style="list-style-type: none"> ❖ Check whether able to create folder using right click on desktop ❖ Check whether able to create folder using windows explorer ❖ Observer in organizing files in different folders using windows explorer ❖ Observer in organizing files in different folders using My Computer
9.	Exercise on using Recycle Bin	<ul style="list-style-type: none">  Able to Use Recycle Bin 	<ul style="list-style-type: none"> ❖ Check Recycle bin whether able to use delete files ❖ Observe files were properly restored files
10.	Exercise on use of My Computer and My Documents	<ul style="list-style-type: none">  Able to Access files and folders in C: Drive  Able Access files and folders in other drives  Able to use My Documents so that organize and access files and folders in it  Able to use My Documents so that Organizing files in My Music, My Pictures, My Videos  Able to create short cut for My Documents on desktop properly 	<ul style="list-style-type: none"> ❖ Check whether able to access files in C: Drive using My Computer correctly or not ❖ Check whether able to access files in other drives using My Computer correctly or not ❖ Check whether able use CD/DVD drive using My Computer ❖ Check whether able to organize files and folders in My Documents ❖ Check Whether able to organize files in My Music, My Pictures, My Videos in My Documents ❖ Check able to create short cut for My Documents on desktop properly
11.	Exercise on creation of shortcut to files and folders (in other folders) on Desktop	<ul style="list-style-type: none">  Able to create shortcut of files and folders on desktop 	<ul style="list-style-type: none"> ❖ Check whether can able to create shortcut for any files created on desktop ❖ Check whether can able to create shortcut for any folder created on desktop
12.	Exercise on arranging of icons – name wise, size, type, Modified	<ul style="list-style-type: none">  Able to arranging of icons – name wise, size, type, Modified on desktop 	<ul style="list-style-type: none"> ❖ Observe whether able to arrange of icons – name wise, size, type, Modified
13.	Exercise on searching of files and folders	<ul style="list-style-type: none">  Able to search of files and folders 	<ul style="list-style-type: none"> ❖ Check searching of files and folders
14.	Exercise on using of explorer for accessing of files and folders	<ul style="list-style-type: none">  Able to use of explorer for accessing of files and folder 	<ul style="list-style-type: none"> ❖ Check use of explorer for accessing of files and folders
15.	Exercise on organizing files / folders using copy and paste of files and folders	<ul style="list-style-type: none">  Able to organizing files / folders using copy and paste of files and folders using explorer  Able to organizing files / folders using copy and paste of files and folders using My Computer 	<ul style="list-style-type: none"> ❖ Check organizing files / folders using copy and paste of files and folders ❖ Check organizing files / folders using copy and paste of files and folders using my computer
16.	Exercise using Calculator from Accessories and through Run	<ul style="list-style-type: none">  Able to use calculator in Standard mode  Able to use calculator in Scientific mode 	<ul style="list-style-type: none"> ❖ Check calculator in Standard mode ❖ Check calculator in Scientific mode
17.	Exercise on shutdown of computer system	<ul style="list-style-type: none">  Able to shutdown of computer system 	<ul style="list-style-type: none"> ❖ Check shutdown of computer system

18.	Exercise on understanding the use of Taskbar	<ul style="list-style-type: none"> ✚ Able to understand the use of Taskbar by opening some applications 	<ul style="list-style-type: none"> ❖ Check the use of Taskbar by opening some applications
19.	Exercise on using of Internet Explorer or any other browser	<ul style="list-style-type: none"> ✚ Able to use of Internet Explorer ✚ Able to use of Mozilla firefox ✚ Able to use of Google Chrome ✚ Able to use of opera 	<ul style="list-style-type: none"> ❖ Check use of Internet Explorer ❖ Check use of Mozilla firefox ❖ Check use of Google Chrome ❖ Check use of opera
20.	Change resolution, color, appearance, screen server options of Display	<ul style="list-style-type: none"> ✚ Able to change resolution, color, appearance, screen server options of Display 	<ul style="list-style-type: none"> ❖ Check resolution, color, appearance, screen server options of Display
21.	Change the system date and time	<ul style="list-style-type: none"> ✚ Able to change system date and time 	<ul style="list-style-type: none"> ❖ Check change system date and time
22.	Open MS-word from (i) Programs (ii) Run and Identify the components on the screen	<ul style="list-style-type: none"> ✚ Able to Open MS-word and Identify the components on the screen 	<ul style="list-style-type: none"> ❖ Check whether able to Identify the components on the screen ❖ Check whether able to Identify all components on the screen of MSWORD are identified and learnt thoroughly
23.	Insertion of new rows and columns in the existing table and changing the background color of the table	<ul style="list-style-type: none"> ✚ Able to Insert new rows and columns in the existing table ✚ Able to Change the background color of the table 	<ul style="list-style-type: none"> ❖ Check whether able to Insert new rows and columns in the existing table ❖ Check whether able to Insert new rows and columns as per requirement ❖ Check whether able to Change the background color of the table
24.	Merging and splitting of cells in a Table	<ul style="list-style-type: none"> ✚ Able to Merge and split cells in a Table using right click method 	<ul style="list-style-type: none"> ❖ Check whether able to Merge and split cells in a Table using right click method
25.	Changing the formatting of font	<ul style="list-style-type: none"> ✚ Able to Change the formatting of font using right click menu ✚ Able to Change the formatting of font using menu options 	<ul style="list-style-type: none"> ❖ Check whether able to Change the formatting of font using right click menu ❖ Check whether able to Change the formatting of font using menu options
26.	Exercise with Headers and Footers	<ul style="list-style-type: none"> ✚ Able to change Headers and Footers using menu option ✚ Able to change Headers and Footers by clicking top and bottom document 	<ul style="list-style-type: none"> ❖ Check whether Able to change Headers and Footers using menu option ❖ Check whether able to change Headers and Footers by clicking top and bottom document
27.	Create mailing letters using mail merge tool of MS-word	<ul style="list-style-type: none"> ✚ Able to use mail merge tool of MS-word using start mail merge option in mail menu 	<ul style="list-style-type: none"> ❖ Check whether Able to use mail merge tool of MS-word in creating letter using mail merge option in mail menu
28.	Open MS-Excel and identify the components on the screen	<ul style="list-style-type: none"> ✚ Able to Open MS-Excel and identify the components on the screen 	<ul style="list-style-type: none"> ❖ Check whether Able to Open MS-Excel and identify the components on the screen ❖ Check whether all components are known on screen
29.	Create a Worksheet in MS-Excel and save it in .xls or .xlsx format	<ul style="list-style-type: none"> ✚ Able to Create a Worksheet in MS-Excel ✚ Able to save it in .xls or .xlsx format 	<ul style="list-style-type: none"> ❖ Check whether Able to Create a Worksheet in MS-Excel ❖ Check whether Able to save it in .xls or .xlsx format
30.	Inserting column and row in Excel	<ul style="list-style-type: none"> ✚ Able to Insert column and row in Excel using menu options ✚ Able to Insert column and row in Excel by right clicking rows or columns appropriately 	<ul style="list-style-type: none"> ❖ Check whether able to Insert column and row in Excel using menu option ❖ Check proper addition rows and columns in given sheet ❖ Check whether able to Insert column and row in Excel by right clicking rows or columns appropriately ❖

31.	Creation of new worksheet in the existing Excel Book file	<ul style="list-style-type: none">  Able to create worksheet in the existing Excel Book file by using Insert worksheet option besides existing sheets 	<ul style="list-style-type: none"> ❖ Verify whether able to create worksheet in the existing Excel Book file by using Insert worksheet option
32.	Generate a Chart using the data in Excel-worksheet	<ul style="list-style-type: none">  Able to Generate a Chart using the data in Excel-worksheet 	<ul style="list-style-type: none"> ❖ Check whether able to Generate a Chart using the data in Excel-worksheet ❖ Verify whether chart prepared is as per the data given
33.	Automate calculations in a worksheet using formula	<ul style="list-style-type: none">  Able to Automate calculations in a worksheet using fx formula  Able to use sigma function  Able to use function library option in formula menu 	<ul style="list-style-type: none"> ❖ Check whether Able to Automate calculations in a worksheet using fx formula ❖ Verify whether Able to use sigma function ❖ Check whether Able to use function library option in formula menu
34.	Sort and filter data in a worksheet	<ul style="list-style-type: none">  Able to Sort data in a worksheet using sort option in Data menu  Able to Sort data in a worksheet using sort option in right click  Able to filter data in a worksheet in data menu  Able to filter data in a worksheet in right click 	<ul style="list-style-type: none"> ❖ Verify whether Able to Sort data in a worksheet using sort option in Data menu ❖ Verify whether Able to Sort data in a worksheet using sort option in right click ❖ Check whether Able to filter data in a worksheet in data menu ❖ Check whether Able to filter data in a worksheet in right click
35.	Inserting a new slide in the existing powerpoint file	<ul style="list-style-type: none">  Able to Insert a new slide in the existing powerpoint file using newslide option in home menu  Able to Insert a new slide in the existing powerpoint file using slide layout option in home menu 	<ul style="list-style-type: none"> ❖ Check whether Able to Insert a new slide in the existing powerpoint file using newslide option in home menu ❖ Check whether Able to Insert a new slide in the existing powerpoint file using slide layout option in home menu
36.	Create a simple Power point presentation for a small topic and saving in .ppt or pptx format	<ul style="list-style-type: none">  Able to create a simple Power point presentation for a given topic  Able to Save the presentation in both .ppt or pptx format 	<ul style="list-style-type: none"> ❖ Check Able to create a simple Power point presentation for a given topic ❖ Check Able to Save the presentation in both .ppt or pptx format
37.	Inserting chart or image in a powerpoint slide	<ul style="list-style-type: none">  Able to Insert chart in a power point slide using Insert menu option  Able to Insert image in a power point slide using insert menu option 	<ul style="list-style-type: none"> ❖ Check Able to Insert chart in a power point slide ❖ Check Able to Insert image in a power point slide
38.	Exercise with animation and sound features in powerpoint	<ul style="list-style-type: none">  Able to work with animation and sound features in power point using custom animation option in Animations menu  Able to work with Media clip options in insert menu 	<ul style="list-style-type: none"> ❖ Check Able to work with animation and sound features in power point using custom animation option in Animations menu ❖ Check Able to work with Media clip options in insert menu
39.	Exercise with Rehearse Timings feature in powerpoint	<ul style="list-style-type: none">  Able to work with Rehearse Timings feature in powerpoint using slide show menu rehearse option 	<ul style="list-style-type: none"> ❖ Check able to work with rehearse timings features
40.	Exercise in printing the powerpoint file in (a) Slides (b) Handout	<ul style="list-style-type: none">  Able to print the powerpoint file in Slides using File menu Print option  Able to print the powerpoint file in Handout using file menu print option 	<ul style="list-style-type: none"> ❖ Check to print the powerpoint file in Slides using File menu Print option ❖ Check to print the powerpoint file in Handout using file menu print option

41.	Create a table for given data and save in .mdb or .accdb format	<ul style="list-style-type: none">  Able to Create a table for given data using table option in create menu  Using table template from create menu  Using table design option from create menu  Able to save given table in .mdb or .accdb format 	<ul style="list-style-type: none"> ❖ Check Able to Create a table for given data using table option ❖ Check Able to Create a table for given data using table template option ❖ Check Able to Create a table for given data using table design option ❖ Check Able to save given table in .mdb or .accdb format
42.	Exercise on Add, Delete and rename fields	<ul style="list-style-type: none">  Able to Add, Delete and rename fields using design menu 	<ul style="list-style-type: none"> ❖ Check able to Add, Delete and rename fields
43.	Use the Primary key field	<ul style="list-style-type: none">  Able to use primary key in table design view  Able to use primary key option from design menu 	<ul style="list-style-type: none"> ❖ Check for usage of primary key ❖ Check for usage of primary key option from design menu
44.	Enter and edit data	<ul style="list-style-type: none">  Able to Enter and edit data 	<ul style="list-style-type: none"> ❖ Check to Enter and edit data correctly
45.	Use Relationships option	<ul style="list-style-type: none">  Use Relationships option from database tools menu 	<ul style="list-style-type: none"> ❖ Check able Use Relationships option from database tools menu ❖ Check whether relationships properly made on given tables
46.	Create forms	<ul style="list-style-type: none">  Able to create forms using form option in create menu  Able to create forms using form design option in create menu  Able to create forms using more form option in create menu 	<ul style="list-style-type: none"> ❖ Check Able to create forms using form option in create menu ❖ Check Able to create forms using form design option in create menu ❖ Check Able to create forms using more form option in create menu
47.	Modify and save forms	<ul style="list-style-type: none">  Able to Modify and save forms 	<ul style="list-style-type: none"> ❖ Check Able to Modify and save forms
48.	Create and use queries	<ul style="list-style-type: none">  Able to Create and use queries from create menu query wizard option  Able to Create and use queries from create menu query design option 	<ul style="list-style-type: none"> ❖ Check Able to Create and use queries from create menu query wizard option ❖ Check Able to Create and use queries from create menu query design option
49.	Create and print reports	<ul style="list-style-type: none">  Able to Create and print reports 	<ul style="list-style-type: none"> ❖ Check able to Create and print reports
50.	Create an email account	<ul style="list-style-type: none">  Able to create email account 	<ul style="list-style-type: none"> ❖ Check able to create an email account
51.	Send an email	<ul style="list-style-type: none">  Able to send an email 	<ul style="list-style-type: none"> ❖ Check Able to send an email
52.	Receive an email	<ul style="list-style-type: none">  Able to receive an email 	<ul style="list-style-type: none"> ❖ Check Able to receive an email
53.	Browse the internet using various search engines	<ul style="list-style-type: none">  Able to search for a content in the internet using various search engines 	<ul style="list-style-type: none"> ❖ Check Able to search for a content in the internet using various search engines