SRINIVASA EDUCATIONAL SOCIETY'S

PACE INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

Approved by AICTE, UGC, New Delhi & Govt. of Andhra Pradesh | Permanently Affiliated to JNTUK, Kakinada, A.P.

ACCREDITED BY **NAAC** WITH **'A'** GRADE | ACCREDITED BY **NBA**

An ISO 9001 : 2008 Certified Institution |'A' Grade Engineering College by Government of A.P.

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DEPARTMENT OF

COMPUTER SCIENCE & ENGINEERING

ACADEMIC REGULATIONS
AND
COURSE STRUCTURE & SYLLABI

(For the students admitted to

B.Tech Regular Four Years Programme from the Academic Year 2018-19

and

B.Tech Lateral Entry Scheme from the Academic Year 2019-20)

ACADEMIC REGULATIONS R-18 FOR B.Tech (REGULAR)

(CHOICE BASED CREDIT SYSTEM)

Applicable for the students of B.Tech (Regular) from the Academic Year 2018-19
&
B.Tech Lateral Entry Scheme from the Academic Year 2019-20

1. ELIGIBILITY CRITERIA FOR ADMISSION

The eligibility criteria for admission into B.Tech programme shall be as per the guidelines issued by the Andhra Pradesh State Council of Higher Education (APSCHE) and/or by any other competent authority.

2. PROGRAMMES OFFERED (UNDER GRADUATE)

A student shall be offered admission into any one AICTE-approved programme as given below:

S.No	PROGRAMME
01	Civil Engineering (CE)
02	Electrical and Electronics Engineering (EEE)
03	Mechanical Engineering (ME)
04	Electronics and Communication Engineering (ECE)
05	Computer Science and Engineering (CSE)
06	Information Technology (IT)
07	Automobile Engineering (AME)

3. AWARD OF DEGREE

A student will be declared eligible for the award of B. Tech. degree, if he/she fulfils the following academic requirements:

i. 4 Year B.Tech Programme:

- The Student shall study a course for not less than four academic years and not more than eight academic years.
- The student shall register for 160 credits and secure all the 160 credits.
- The students, who fail to fulfil all the academic requirements for the award of degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech Programme.

- Students shall secure a satisfactory grade (SA) in all Mandatory Courses (Non Credit Courses/Activities).
- No disciplinary action pending against the student by the time of the completion of his/her course. If any disciplinary action is pending against any student, he/she should not be awarded with the degree.

ii. 3 Year B.Tech Programme under Lateral Entry Scheme (LES):

- The Student shall study a course for not less than three academic years and not more than six academic years.
- The student shall register for 120 credits and secure all the 120 credits.
- The students, who fail to fulfil all the academic requirements for the award of degree within six academic years from the year of their admission, shall forfeit their seat in B.Tech programme.
- Students shall secure a satisfactory grade (SA) in all non-credit courses/ activities. (Non Credit Courses/Activities).
- No disciplinary action pending against the student by the time of the completion of his/her course. If any disciplinary action is pending against the student, he/she should not be awarded with the degree.

4. MEDIUM OF INSTRUCTION

The medium of instruction shall be English in all academic activities.

5. MINIMUM INSTRUCTION DAYS

The minimum instruction days for each Semester shall be 90.

6. CATEGORIZATION OF COURSES

6.1 Choice Based Credit System (CBCS)

The CBCS provides choice for students to select from the prescribed courses (core, elective or minor or soft skill courses). The CBCS provides a 'cafeteria' type approach in which students can take courses of their choice, learn at their own pace and adopt an interdisciplinary approach to learning.

6.2 The curriculum of each programme shall contain various courses indicated in the following categories to train the students for employment, higher learning & research and entrepreneurship.

i. **Humanities and Social Sciences (HS):** These courses include Technical English, Environmental Science and Engineering, Industrial Management, Managerial Economics & Financial Accountancy, Communication skills etc.

ii. **Basic Sciences (BS):** These courses include Mathematics, Physics, Chemistry, Biology etc.

iii. **Engineering Sciences (ES):** These courses include Workshop, Drawing, Basic Electrical/Mechanical/Computer etc.

iv. **Professional Core (PC):** These courses are the core courses that provide the requisite foundation in the chosen Branch of Engineering.

v. **Professional Elective (PE):** These courses are the elective courses opted by the students relevant to the chosen branch of engineering that provides the requisite foundation in a specific area of specialization.

vi. **Open Elective (OE):** These courses are inter-disciplinary in nature offered by other departments and/or any emerging subjects.

The department offers an elective course (PE/OE), if the number of students registered in such a course is a minimum of 20.

vii. **Add-on Courses:** Add-on courses are Skill enhancement courses for the students in the respective branch of engineering.

viii. **MOOCS/Self Study Courses:** An opportunity is given to the students to choose one online course offered by SWAYAM-NPTEL / Foreign institutions/ reputed universities to enhance the learning skills or a self-study course under the guidance of the faculty advisor to enhance the self-learning capabilities which are having Global acceptance.

ix. **Personality Development (PD):** These courses include Integrated Learning Practices (ILPs), Mandatory Courses (MCs) & Extra-curricular/Co-curricular activities and help the students into a well-trained professionals and good human beings with a high employability potential, good communication skills, soft skills, good engineering practices, personality transformation, professional presentation skills and networking skills.

x. **Mandatory Courses (MC):** The Professional Ethics & Human Values, Employability Enhancement Skills. Environmental Sciences, Indian Constitution, Essence of Indian Traditional Knowledge, Problem-assisted learning and Problem-based learning are non-credit courses relevant to the value education and also for enhancing employability skills.

- In addition to the above courses to enhance the overall personality & character of students and make them aware of social needs, the extra-curricular/co-curricular activities are included, which do not carry any credits. These activities include National Service Scheme (NSS), National Cadet Corps (NCC), Sports & Games and Professional Club Activities.
- The Students shall undergo Industrial /In-house training to expose them to the practical environment.
- A faculty advisor or counselor shall be assigned to a group of 20 students, and he/she will advise the students about the under graduate programme, its course structure and curriculum, choice/option for course based on their competence, progress, pre-requisites and interest.

xi. **Mini-Project:** A student is required to undergo a mini project of his/her choice by applying theoretical concepts to develop a practical component /element/system that includes design/ testing/ analysis.

xii. **Summer School Practices:**

Industry Internship: Internship must involve practical work related to systems engineering, industry practices etc. The internship can be carried out at premier institutions/ research laboratories/industries.

7. CREDIT ASSIGNMENT

Each course is assigned a certain number of credits based on the following criteria.

Contact hours per week			Credits
L	**T**	**P**	
1	0	0	1
0	1	0	1
0	0	2	1

8. REGISTRATION OF COURSES

The entire programme of study is for four academic years (three academic years in case of LES), all the years are on semester pattern. As per the curriculum the student shall register for 160 credits from all the courses as specified for the programme of study under regular four years. As per the

curriculum the student shall register for 120 credits from all the courses as specified for the programme of study under regular four years.

9. ASSESSMENT AND EVALUATION

The performance of a student in each course shall be evaluated based on Continuous Internal Evaluation (CIE) and Semester End Examination (SEE) or only Continuous Internal Evaluation.

S.No	Category of Course	Marks	
		CIE	SEE
1	Theory Courses	40	60
2	Laboratory Courses	40	60
3	Mandatory Courses	100	-
4	Mini Project	100	-
5	Seminar	100	-
6	Internship	100	-
7	Project Work	80	120

9.1 THEORY COURSES

9.1.1 Continuous Internal Evaluation (CIE):

The CIE of a theory course consists of four components as indicated in the following table.

S.No	Component	Marks
1	Mid-Term- Descriptive Examinations	20
2	Online Quiz Examinations	10
3	Assignments with Viva Voce	05
4	Class Room Test	05
	Total	**40**

a) Mid Term Descriptive Examinations (20 Marks):

There shall be two mid-term descriptive examinations of 120 minutes each. The mid-term examinations shall be conducted with syllabi from units I,II & first half of III for the first mid and second half of III, IV & V units for the second mid. In each theory course, the question paper for the mid-term descriptive examination consists of four questions. A student is required to answer all four questions for maximum 20 marks.

b) Online Quiz Examinations (10 marks):

Two online quiz examinations of 20 minutes each shall be conducted with syllabi from units I,II & first half of III for the first mid and second half of III, IV & V units for the second mid. The online quiz examination shall have 20 multiple choice questions for maximum 10 marks.

c) Assignments with Viva Voce (5 Marks):

A Student shall submit five Assignments with Viva Voce to the concerned faculty from all five units. The Assignment shall be evaluated by the concerned faculty. The average of best four assignment marks shall be considered for awarding 05 marks.

d) Class Room Test (5 Marks):

There shall be conducted 5 Class Room Tests from 5 units. The tests shall be conducted and evaluated by the concerned faculty. The average of best four class room tests considered for awarding 05 marks.

Assignment with Viva Voce and Class Room Tests marks will be evaluated at the end of the Semester.

CIE is Computed as following: Finalized internal marks can be calculated with 80% weightage for the better of the two mid-term examinations and 20% for the other shall be considered for marks of 30 and is added to Assignment with Viva Voce 05 marks, Class Room Tests 05 marks for awarding total 40 marks.

There shall be no Assignment with Viva Voce and Class Room Tests for Applied/Engineering Physics Course. Finalized internal marks for Applied/Engineering Physics Course can be calculated with 80% weightage for the better of the two mid-term examinations and 20% for the other shall be considered for marks of 30 and is added to Virtual Lab-Assignments 10 marks for awarding total 40 marks.

For the courses like Engineering Graphics, Machine Drawing and Design courses the CIE shall be 40 marks (20 marks for day-to-day work, 20 marks for two mid-term examinations) and 60 marks for SEE. A student is required to answer all 4 questions for maximum 20 marks. The final assessment of mid-term examinations is based on 80% weightage for the better and 20% for the other.

9.1.2 Semester End Examinations (SEE)

The semester end examinations for theory courses (including Engineering Graphics and Engineering Drawing) will be conducted covering all the units for 60 Marks. The question paper consists of two parts. In Part-A There shall be compulsory first question containing 5 two marks questions and these are to be set from the entire syllabus. In Part-B There shall be one question from each unit with internal choice. Each question carries 10 marks. Each theory course shall consist of five units of syllabus. Part-A and Part-B put together are given for 60 Marks.

Special Subjects: The SEE question paper for Design courses like Building Planning & Drawing, Design & Drawing of Steel Structures, and Design & Drawing of Steel Structures Reinforced Concrete Structures consists of two parts. In Part-A there shall be one question out of 2 questions is to be answered for 24 marks and in Part-B 3 Questions out of 5 Questions are to be answered of which each carries 12 Marks in 3 hours time. Part-A and Part-B put together are given for 60 Marks.

9.2 LABORATORY COURSES

9.2.1 Continuous Internal Evaluation (CIE)

The continuous internal evaluation for laboratory courses is based on the following parameters:

Parameter	Marks
Day-to-day work	20
Internal test	10
Record	05
Viva voce	05
Total	40

9.2.2 Semester End Examinations (SEE)

The performance of the student in laboratory courses shall be evaluated jointly by internal and external examiners for 3 hours duration as per the parameters indicated below:

Parameter	Marks
Procedure/Algorithm	10
Experimentation/Program Execution	15
Observations/Calculations/Testing	15
Result/Inference	10
Viva Voce	10
Total	**60**

9.3 MANDATORY COURSES (NON CREDIT COURSES)

Mandatory courses are evaluated by the mode of a Presentation/ Comprehensive-Viva Voce/ Evaluation of Assignments. A student shall secure a minimum 40% of marks to get a satisfactory grade (SA). Otherwise unsatisfactory grade (US) will be indicated. However, a student who secures "US" grade /abstains shall reappear in the subsequent semester(s).

9.4 MINI-PROJECT

A student is required to undergo a mini project of his/her choice by applying theoretical concepts to develop a practical component /element/system that includes design/ testing/ analysis. The performance of a student in the mini project shall be evaluated by a three-member committee constituted by the HoD as per the following parameters:

Parameter	Marks
Mini project Report	30
Innovation	25
Presentation	25
Viva Voce	20
Total	**100**

The performance of a student in mini project shall be evaluated based on two reviews, each carries 100 marks. The average marks of these two reviews will be awarded. However, a student who fails to secure minimum

40% marks or abstains will be permitted to reappear in the subsequent semester(s). There shall be no semester end examination.

9.5 SEMINAR

A student shall deliver a seminar on any emerging topic of his/her choice from the core technical domain. The student shall submit a duly-certified seminar report. A three-member committee constituted by the HoD will finalize the CIE marks based on the following parameters:

Parameter	Marks
Seminar report	30
Innovation	20
Presentation	30
Viva Voce	20
Total	**100**

A student who fails to secure minimum 40% marks or abstains will be permitted to reappear in the subsequent semester(s). There shall be no semester end examination.

9.6 INTERNSHIP

Internship must involve practical work related to industry practices. The students shall undergo internship for a period of minimum 4 weeks continuously at the end of VI semester and shall be evaluated in VII semester. The internship can be carried out at premier institutions/ research laboratories/industries.

A student shall submit a report on the training undergone, along with a certificate from the organization. A three-member committee constituted by the HoD shall finalize the CIE marks based on the following parameters:

Parameter	Marks
Internship Report	50
Presentation	30
Viva Voce	20
Total	**100**

The Internal guide shall monitor the work progress and regularity of the students in periodic intervals. No financial support shall be provided by the Institute for Internship.

A student, who fails to secure minimum 40% marks or abstains, will be permitted to reappear in the subsequent semester(s). There shall be no semester end examination.

9.7 Project Work

A student is required to undertake a project work by using the knowledge acquired by him/her during the course of study. The student is expected to design and build a complete system or subsystem on an area of interest. The project work consists of two parts namely, project literature review and project implementation. A project work shall be carried out by a batch minimum of 4 Student members under a faculty supervisor.

i. Continuous Internal Evaluation:

The CIE for project work shall be based on project survey and project implementation and is evaluated by a three-member committee consisting of two senior faculties and a project supervisor constituted by the HoD.

- **Project Literature Review:**

The performance of a student in project survey shall be evaluated based on the following parameters:

Parameter	Marks
Literature Review	15
Presentation	15
Viva Voce	10
Total	40

- **Project Implementation:**

The performance of a student in project implementation shall be evaluated based on two reviews, each carries 40 marks. The average marks of these two reviews will be considered. The evaluation criterion of each review is based on the following parameters:

Parameter	Marks
Contribution	10
Innovation	10
Presentation	10
Viva Voce	10
Total	**40**

The marks secured by a student in project literature review and project implementation shall be awarded cumulatively as CIE of the project work in VIII semester.

ii. Semester End Examination:

A batch of students shall submit a duly-certified project report to the department in a specified time. They shall make a presentation on the project work before a three-member committee consisting of external examiner, internal examiner (HoD) and a project supervisor. The performance of each student is evaluated as per the following parameters:

Parameter	Marks
Project report	40
Innovation	30
Presentation	20
Viva Voce	15
Research Publication (Seminar/Conference/Symposium/Journal)	10
Scope of Implementation	05
Total	**120**

A student who fails to secure minimum 40% marks or abstains is permitted to re-appear in the advanced supplementary examinations or when offered next.

9.8 OTHER COURSES

a. Online (MOOCS) / Self Study Course:

Institute encourages the students to register and satisfy for MOOCs Certificate. A student is awarded certificates for 4 weeks programme – 1 credit, 8 weeks programme – 2 credits and 12 weeks programme – 4 credits.

b. Add-On Courses:

ADD-ON Courses are provided by the Institution with Industry Interaction to enhance skills in the domain of the study.

c. Extra-Curricular / Co-Curricular Activities:

The participation of a student is compulsory in any one of the extra-curricular/co-curricular activities (non-credit) such as NSS, NCC, Sports & Games, Professional club activities during the semesters I to VII for

award a Satisfactory grade (SA). The performance of a student in the extra-curricular/co-curricular activities is evaluated during VII semester by a three member committee constituted by HoD.

For physically disabled students, the satisfactory grade (SA) will be awarded, if he/she obtains certificate in co-curricular activities such as essay writing, debate competitions, technical & general quizzes, symposium etc.

However, a student who secures unsatisfactory grade (US) shall reappear in the subsequent semester(s).

10. ATTENDANCE REQUIREMENTS

a. A student is eligible to write the Semester End Examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects.
b. Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in two times upto III Year II Semester and once in IV Year may be granted by the College Academic Committee on medical grounds.
c. A stipulated fee shall be payable towards condonation of shortage of attendance.
d. If any candidate fulfills the attendance requirement in the present semester, he shall not be eligible for readmission into the same class.
e. Shortage of Attendance below 65% in aggregate shall not be condoned.
f. A student who is shortage of attendance in semester may seek re-admission into that semester when offered within one week from the date of the commencement of class work.
g. Students whose shortage of attendance is not condoned in any semester are not eligible to write their Semester End Examination of that class.

11. MINIMUM ACADEMIC REQUIREMENTS

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no.10.

a. A student shall be deemed to have satisfied the minimum academic requirements, if he/she gains the credits allotted to each course and secures not less than a minimum 35% of marks exclusively at the Semester End

Examination. However, the student should secure minimum 40% of marks in both CIE and SEE put together to be eligible for passing the course.

b. A student shall be promoted from II Semester to III Semester if he/she fulfills the minimum attendance requirement.

c. A student will be promoted from IV Semester to V Semester if he/she fulfills the academic requirement of 50% of the credits up to either III Semester or IV Semester from all the examinations, whether the candidate appears or not for the examinations and secures prescribed minimum attendance in IV Semester.

   The students admitted under Lateral Entry Scheme shall be promoted to the V semester, if he/she fulfills the minimum attendance requirement in IV Semester.

d. A student will be promoted from VI Semester to VII Semester if he/she fulfills the academic requirement of 50% of the credits up to either V Semester or VI Semester from all the examinations, whether the candidate appears or not for the examinations and secures prescribed minimum attendance in VI Semester.

   The students admitted under Lateral Entry Scheme shall be promoted to the VII semester, if he/she fulfills the academic requirement of 50% of the credits up to either V Semester or VI Semester from all the examinations, whether the candidate appears or not for the examinations and secures prescribed minimum attendance in VI Semester.

e. The Students who fail to earn 160 credits as indicated in the course structure within 8 academic years from the year of admission shall forfeit their seat in B.Tech programme and admission stands cancelled.

f. The students admitted under Lateral Entry Scheme, who fail to earn 120 credits as indicated in the course structure within 6 academic years from the year of admission, shall forfeit their seat in B.Tech programme and admission stands cancelled.

12. PROCEDURES FOR SEMESTER END EXAMINATIONS

i. **Supplementary examinations:** There shall be supplementary examinations along with regular semester end examinations for a student to reappear in the course(s) he/she failed or not attempted.

ii. **Advanced supplementary examinations:** Students who fail in the courses in VIII semester (theory/project work) can reappear for advanced supplementary examinations within one month after the declaration of the revaluation results. However, the students who fail in advanced supplementary examinations shall reappear when offered next along with regular students.

iii. **Recounting:** A student, who wishes to verify the total marks obtained by him/her in any theory course in SEE can apply for recounting in response to the notification along with the prescribed fee. The outcome of the recounting gets reflected in the results sheet and grade card.

iv. **Revaluation:** A student who wishes to apply for revaluation of a theory course in SEE can submit an application along with the prescribed fee as per the notification issued.

a. If the variation in marks of the first valuation and revaluation is ≤ 15% of the total marks, then the better of the two evaluations shall be considered as final marks.

b. If the variation of marks between the first valuation and revaluation is >15% of the total marks, there shall be a third evaluation by another examiner. The average marks of two nearer evaluations shall be taken into consideration. In case of any fractional value of marks, it can be rounded off to the next integer value.

c. If a student secures a higher grade in the revaluation, that grade will be declared as the final grade. Otherwise, the original grade will remain valid.

13. AWARD OF LETTER GRADES

A letter grade and grade points shall be awarded to a student in each course based on his/her performance as per the 10-point grading system given below.

Marks (Max:100)	Letter Grade	Grade Point	Level
≥ 90	O	10	Outstanding
80 to <90	S	9	Excellent
70 to <80	A	8	Very Good
60 to <70	B	7	Good
50 to <60	C	6	Fair

40 to <50	P	5	Pass
<40	F	0	Fail
--	Ab	0	Absent

Marks (Max:100)	Letter Grade	Grade Point	Level
≥ 40	SA	-	Satisfactory
< 40	US	-	Unsatisfactory
--	Ab	-	Absent

a. A student who secures from 'O' to 'D' grades in a course is declared to have successfully completed the course, and is deemed to have secured the credits assigned to that course.

b. A student who secures "F" grade in any course shall be considered "Failed" and is required to reappear as "Supplementary student" in SEE, as and when offered. In such cases, his/her CIE marks in those courses will remain same as obtained earlier.

c. A student, who is absent from any examination shall be treated as "Failed".

d. In general, a student shall not be permitted to repeat any course (s) for the sake of "Grade improvement" or "SGPA/CGPA improvement".

e. As per AICTE guide lines, If a student acquires additional 20 credits through online Certification (approved MOOCs), he/she will be awarded Graduate degree with Honours with subjected to JNTUK instructions.

If a Student from CE,EEE,ME,ECE & AME secures 20 credits from MOOCs courses (apart from Courses mentioned in Course Structure) in Computer Science & Engineering related courses is he/she will be awarded with additional Minor Engineering with Computer Science & Engineering with subjected to JNTUK instructions.

14. COMPUTATION OF SGPA & CGPA

a. Semester Grade Point Average (SGPA)

The performance of each student at the end of each semester is indicated in terms of SGPA. The SGPA is the ratio of sum of the product of the number of credits and the grade points scored by a student in all the courses to the sum of the number of credits of all the courses.

SGPA (S_i) = Σ (C_i x G_i) / ΣC_i

Where C_i is the number of credits of the i^{th} course and G_i is the grade point scored by the student in the i^{th} course.

b. Cumulative Grade Point Average (CGPA)

The CGPA is a measure of the overall cumulative performance of a student. The CGPA is calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme.

CGPA = Σ (C_i x S_i) / ΣC_i

Where S_i is the SGPA of the i^{th} semester and C_i is the total number of credits in that semester.

c. The SGPA and CGPA are rounded off to 2 decimal points and reported in grade cards.

15. AWARD OF CLASS

A student, who satisfies the minimum requirements prescribed for the completion of a programme, is eligible for the award of B.Tech degree and he/she shall be placed in one of the following four classes on a 10 point scale.

Class Awarded	**CGPA to be secured**	From the CGPA secured from 160 Credits
First Class with Distinction	≥ 7.75 with no subject failures	
First Class	≥ 6.75 with subject failures	
Second Class	≥ 5.75 to < 6.75	
Pass Class	≥ 4.75 to < 5.75	

Equivalent percentage = (CGPA – 0.75) x 10

16. GAP YEAR

a. A student is permitted to make use of the gap year facility at the beginning of V / VII semester of the programme and undergo training programs at premier institutions / research laboratories/ industries for a maximum period of one year (two consecutive semesters of academic

year), if he/she secures a CGPA of 7.75 and above with no backlog of courses.

b. A student is permitted to avail the gap year facility only once during the entire course of study.

c. The students are permitted to re-join the programme after availing gap year facility. However, their re-joining is subject to the regulations prevailing at that time.

d. The total period for completion of the programme reckoned from, the commencement of the first semester to which the student is admitted shall not exceed the maximum period in order that the student is eligible for the award of the degree.

e. If a student fails to report to the department after the expiry of 2 semesters, his/her readmission will be subject to the decision of competent authority.

f. A student seeking a gap year needs to apply in the prescribed format before the last working day of the running semester. The application submitted by the student shall be evaluated by Department Academic Committee and forwarded to the head of the institution for approval.

g. The duration of the gap year shall be reflected in the consolidated grade card.

17. DISCIPLINE

a. A student is required to observe discipline and decorum both inside and outside the college and not to indulge in any activity that may tarnish the prestige of the college. The head of the institution shall constitute a disciplinary committee to enquire into acts of indiscipline and notify the college about the disciplinary action taken. In case of any serious disciplinary action, which leads to suspension or dismissal, a committee shall be constituted by head of the institution for taking final decision.

b. Those students who indulge in examination related malpractices shall be punished as per the scale of punishment notified in Annexure-I.

c. Those students involved in the illegal acts of ragging shall be punished as per the provisions of Act 26, 1997 of Govt. of Andhra Pradesh (Annexure-II).

18. REVISION OF REGULATIONS, CURRICULUM AND SYLLABI

The college may revise, amend or change the regulations, curriculum, syllabus and scheme of examinations from time to time subject to decisions/recommendations of Board of Studies and the College Academic Council.

19. WITHHOLDING OF RESULTS

If a student fails to clear dues, if any, payable to the institution or any case of indiscipline is pending against him, the result of the student will be withheld, and also the award of his/her degree shall be withheld in such cases.

20.TRANSITORY REGULATIONS

a. A student, who is detained or discontinued in the semester, on readmission shall be required to do all the courses in the curriculum prescribed for the batch of students in which the student joins subsequently. However, exemption will be given to those students who have already passed the courses in the earlier semester(s) he/she is originally admitted into and substitute courses/additional courses are offered in place of them as approved by the Board of Studies.

b. In general, after transition, there will be a fitment formula approved by the competent authority in order to balance course composition and the number of credits.

c. Students admitted by transfer from other institutions shall follow transitory regulations with suitable fitment formulae approved by the competent authority.

d. A student who is seeking readmission shall apply in the prescribed format within one week after the commencement of the class work. However, the readmission of a student shall be approved by the competent authority.

21.COURSE CODE

The Course Codes will be given by the departments concerned to the course. Each course code contains 8 characters. The 8 characters for each subject will be filled as per the following description.

1	2	3	4	5	6	7	8

1 Character : Institute Name as '**P**'

2,3 Characters: Year of Commencement of Regulations as '**18**'

4,5 Characters: Subject/Branch Category such as

HS for Humanities and Social Science Courses

BS for Basic Science Courses

ES for Engineering Science Courses

CE for Civil Engineering Courses

EE for Electrical & Electronics Engineering Courses

ME for Mechanical Engineering Courses

EC for Electronics & Communication Engineering Courses

CS for Computer Science & Engineering Courses

IT for Information Technology Courses

AE for Automobile Engineering Courses

MC for Mandatory Courses

PD for Personality Development

6 Character: Mode of Subject Learning and Evaluation such as

T for Theory Courses

L for Laboratory Courses

S for Seminar

P for Project

M for Mini Project

V for Viva Voce

E for Professional Elective Courses

O for Open Elective Courses

I for Internship

7,8 Characters: Serial number of the course taught by the department in that Semester such 01, 02, 03,..... etc

22. GENERAL

- Wherever the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".
- The academic regulations should be read as a whole for the purpose of any interpretation.

- In case of any doubt or ambiguity in the interpretation of the above rules, decision of the competent authority is final and binding.
- The college may change or amend academic regulations or syllabi at any time subject to approval of the competent authority and the changes or may be apply the amendments made to all students with effect from the dates notified.

23. STATUTORY DECLARATION

In case the regulations do not specify application of an appropriate rule in a unique case, the decision of the competent authority of the college shall be final.

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ANNEXURE-I

MALPRACTICE RULES

DISCIPLINARY ACTION FOR MALPRACTICE/IMPROPER CONDUCT IN EXAMINATIONS

S.No	Nature of Malpractices/Improper Conduct	Punishment
1 (a)	If a student possesses or tries to access any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	If a student gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	If a student is found to have copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work, and shall not be permitted to appear for the remaining examinations of the subjects of that Semester. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connection with the examination	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the Examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester. The candidate is also debarred for two consecutive semesters from class work and all Semester End Examinations. The

		continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is to be registered against him.
4.	If a student smuggles inside the exam hall an Answer book or additional sheet or takes out or Arranges to send out the question paper or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester. The candidate is also debarred for two consecutive semesters from class work and all Semester End Examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	If a student uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in the subject.
6.	If a student refuses to obey the orders of the Chief Superintendent/Controller of Examinations / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	Such a student(s) shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester. The candidates also are to be debarred and forfeited their seats. In case of outsiders, they will be handed over to the police and a police case is to be registered against them.

7.	If a student leaves the exam hall taking away answer script or intentionally tears the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester. The candidate is also debarred for two consecutive semesters from class work and Semester End Examinations. The continuation of the course by the candidate is subjected to the academic regulations in connection with forfeiture of the seat .
8.	If a student possesses any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester. The candidate is also to be debarred and forfeited the seat.
9.	If a student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student shall be expelled from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester. The candidate is also to be debarred and forfeited the seat. Person(s) who do not belong to the College will be handed over to police and, a police case shall be registered against them.
10.	If a student comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester.
11.	If copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester examinations.

Malpractices identified by squad or special invigilators

- Punishments to the candidates are as per the above guidelines.
- Punishment to institutions : (if the squad reports that the college is also involved in encouraging malpractices)
    i. A show cause notice shall be issued to the college.
    ii. Impose a suitable fine on the college.
    iii. Shifting the examination centre from the college to another college for a specific period of not less than one year.

ANNEXURE-II


Ragging
Prohibition of ragging in educational institutions Act 26 of 1997
Salient Features
Ragging within or outside any educational institution is prohibited.
Ragging means doing an act which causes or is likely to cause Insult or Annoyance of Fear or Apprehension or Threat or Intimidation or outrage of modesty or Injury to a student
Imprisonment upto
Fine Upto
Teasing, Embarrassing and Humiliation
6 Months
+
Rs. 1,000/-
Assaulting or Using Criminal force or Criminal intimidation
1 Year
+
Rs. 2,000/-
Wrongfully restraining or confining or causing hurt
2 Years
+
Rs. 5,000/-
Causing grievous hurt, kidnapping or Abducts or rape or committing unnatural offence
5 Years
+
Rs. 10,000/-
Causing death or abetting suicide
10 Years
+
Rs. 50,000/-
In Case of Emergency CALL TOLL FREE NO. : 1800 - 425 - 1288
ABSOLUTELY NO TO RAGGING
1. Ragging is prohibited as per Act 26 of A.P. Legislative Assembly, 1997.
2. Ragging entails heavy fines and/or imprisonment.
3. Ragging invokes suspension and dismissal from the College.
4. Outsiders are prohibited from entering the College and Hostel without permission.
5. Girl students must be in their hostel rooms by 7.00 p.m.
6. All the students must carry their Identity Cards and show them when demanded
7. The Principal and the Wardens may visit the Hostels and inspect the rooms any time.

B.TECH COURSE STRUCTURE

R-18 REGULATIONS

I YEAR I SEMESTER								
S.No	Course Code	Course	L	T	P	Credits	Internal	External
1	P18MCT01	Induction program	3 weeks			0	-	-
2	P18HST01	English-I	3	0	0	3	40	60
3	P18BST01	Mathematics - I	3	0	0	3	40	60
4	P18BST03	Applied Physics	3	0	0	3	40	60
5	P18EST03	C-Programming for Problem Solving	3	0	0	3	40	60
6	P18EST02	Engineering Graphics	1	0	4	2.5	40	60
7	P18HSL01	English Language & Communication Skills lab	0	0	3	1.5	40	60
8	P18BSL01	Applied Physics Lab	0	0	3	1.5	40	60
9	P18ESL03	C-Programming for Problem Solving Lab	0	0	3	1.5	40	60
10	P18ESL02	Engineering Workshop	0	0	3	1.5	40	60
Total			13	0	16	20.5	360	540

I YEAR II SEMESTER								
S.No	Course Code	Course	L	T	P	Credits	Internal	External
1	P18HST02	English-II	3	0	0	3	40	60
2	P18BST02	Mathematics – II	3	0	0	3	40	60
3	P18BST05	Applied Chemistry	3	0	0	3	40	60
4	P18EST01	Basic Electrical and Electronics Engineering	3	0	0	3	40	60
5	P18EST04	Python Programming	3	0	0	3	40	60
6	P18BSL03	Applied Chemistry Lab	0	0	3	1.5	40	60
7	P18ESL01	Basic Electrical and Electronics Engineering Lab	0	0	3	1.5	40	60
8	P18ESL04	Python Programming Lab	0	0	3	1.5	40	60
Total			15	0	9	19.5	320	480

II YEAR I SEMESTER								
S.No	Course Code	Course	L	T	P	Credits	Internal	External
1	P18CST01	JAVA Programming	3	0	0	3	40	60
2	P18CST02	Data Structures	3	1	0	4	40	60
3	P18ECT20	Digital Logic Design	3	0	0	3	40	60
4	P18BST07	Mathematics - III	3	0	0	3	40	60
5	P18CST03	Free Open Source Software	1	0	2	2	40	60
6	P18CSL01	JAVA Programming Lab	0	0	3	1.5	40	60
7	P18CSL02	Data Structures Lab	0	0	3	1.5	40	60
8	P18ECL11	Digital Logic Design Lab	0	0	3	1.5	40	60
9	P18MCT02	Environmental Sciences	3	0	0	0	-	-
Total			16	1	11	19.5	320	480

II YEAR II SEMESTER								
S.No	Course Code	Course	L	T	P	Credits	Internal	External
1	P18CST04	Discrete Mathematics	3	0	0	3	40	60
2	P18CST05	Computer Organization	3	0	0	3	40	60
3	P18CST06	Formal Languages & Automata Theory	3	1	0	4	40	60
4	P18CST07	Database Management Systems	3	1	0	4	40	60
5	P18BST08	Mathematics - IV	3	0	0	3	40	60
6		**Open Elective – I**	2	0	0	2	40	60
7	P18CST08	Linux Programming	1	0	2	2	40	60
8	P18CSL03	Database Management Systems Lab	0	0	3	1.5	40	60
9	P18MCT03	Indian Constitution	3	0	0	0	-	-
Total			21	2	5	22.5	320	480

S.No	Course Code	Offered By Dept.	Open Elective – I
1	P18CSO01	BS&H	Statistics with R
2	P18CSO02	ECE	Introduction to MAT LAB
3	P18CSO03	ME	Engineering Mechanics
4	P18CSO04	CSE/IT	Object oriented Programming through C++

III YEAR I SEMESTER								
S.No	Course Code	Course	L	T	P	Credits	Internal	External
1	P18CST09	Computer Networks	3	1	0	4	40	60
2	P18CST10	Operating Systems	3	1	0	4	40	60
3	P18CST11	Complier Design	3	0	0	3	40	60
4	P18CST12	Software Engineering	3	0	0	3	40	60
5		**Professional Elective – I**	3	0	0	3	40	60
6		**Open Elective-II**	2	0	0	2	40	60
7	P18CSL04	Computer Networks Lab	0	0	2	1	40	60
8	P18CSL05	Software Lab-1	0	0	3	1.5	40	60
9	P18MCT04	Soft Skills - I	2	0	0	0	-	-
Total			19	2	5	21.5	320	480

Professional Elective – I		
S.No	Course Code	Course
1	P18CSE01	Principles of Programming Languages
2	P18CSE02	Advanced Computer Architecture
3	P18CSE03	Computer Graphics
4	P18CSE03	Distributed Databases

S.No	Course Code	Offered By Dept.	Open Elective – II
1	P18CSO05	BS&H	Fuzzy Sets and Logic
2	P18CSO06	MBA	Managerial Economics & Financial Analysis
3	P18CSO07	ECE	Data Communications
4	P18CSO08	CSE/IT	IT systems Management

III YEAR II SEMESTER								
S.No	Course Code	Course	L	T	P	Credits	Internal	External
1	P18CST13	Data Warehousing & Data Mining	3	0	0	3	40	60
2	P18CST14	Web Technologies	3	0	0	3	40	60
3	P18CST15	Design & Analysis of Algorithms	3	1	0	4	40	60
4		**Professional Elective-II**	3	0	0	3	40	60
5		**Open Elective –III**	2	0	0	2	40	60
6	P18MCT04	Ethics & Human Values	2	0	0	2	40	60
7	P18CSL06	Web Technologies Lab	0	0	3	1.5	40	60
8	P18CSL07	Data Warehousing & Data Mining Lab	0	0	3	1.5	40	60
9	P18CSP01	Mini Project-I	0	0	6	3	100	-
10	P18MCT05	Soft Skills - II	2	0	0	0	-	-
Total			18	1	12	23	420	480

Professional Elective – II		
S.No	Course Code	Course
1	P18CSE05	Artificial Intelligence
2	P18CSE06	Distributed Systems
3	P18CSE07	Middle Ware Technologies
4	P18CSE08	Mobile and adhoc Networks

S.No	Course Code	Offered By Dept.	Open Elective – III
1	P18CSO09	MBA	Management Science
2	P18CSO10	ECE	Embedded Systems
3	P18CSO11	ECE	Microprocessors & Micro Controllers
4	P18CSO12	CSE/IT	Database Systems

IV YEAR I SEMESTER								
S.No	Course Code	Course	L	T	P	Credits	Internal	External
1	P18CST16	Cryptography & Network Security	3	0	0	3	40	60
2	P18CST17	OOAD with UML	3	0	0	3	40	60
3		**Professional Elective-III**	3	0	0	3	40	60
4		**Professional Elective-IV**	3	0	0	3	40	60
5		**Open Elective-IV**	2	0	0	2	40	60
6	P18CSL08	Mobile Application Development	2	0	2	3	40	60
7	P18CSL09	UML Lab	0	0	3	1.5	40	60
8	P18PDL01	Employability Skills	0	0	2	1	40	60
9	P18CSP02	Internship	0	0	0	2	100	-
Total			16	0	7	21.5	420	480

Professional Elective – III		
S.No	Course Code	Course
1	P18CSE09	Machine Learning
2	P18CSE10	Scripting Languages
3	P18CSE11	Hadoop & Big Data
4	P18CSE12	Image Processing

Professional Elective – IV		
S.No	Course Code	Course
1	P18CSE13	Multimedia Application Development
2	P18CSE14	Internet of Things
3	P18CSE15	Soft Computing Techniques
4	P18CSE16	Cloud Computing

S.No	Course Code	Offered By Dept.	Open Elective – IV
1	P18CSO13	MBA	Entrepreneurial Development
2	P18CSO14	MECH	Fundamentals of ROBOTICS
3	P18CSO15	ECE	Introduction to Wireless Networks
4	P18CSO16	CSE/IT	Distributed Databases

IV YEAR II SEMESTER								
S.No	Course Code	Course	L	T	P	Credits	Internal	External
1		**Professional Elective-V**	3	0	0	3	40	60
2		**Professional Elective-VI**	3	0	0	3	40	60
3	P18CSP03	Project	0	0	12	6	80	120
Total			6	0	12	12	160	240

Professional Elective – V		
S.No	Course Code	Course
1	P18CSE17	E- Commerce
2	P18CSE18	Information Retrieval Systems
3	P18CSE19	Data Science
4	P18CSE20	Cyber Security

Professional Elective – VI		
S.No	Course Code	Course
1	P18CSE21	Mobile Computing
2	P18CSE22	Software Testing Methodologies
3	P18CSE23	Block Chain Technology
4	P18CSE24	Human Computer Interaction

B.Tech. I Year I Semester **Course Structure**

L	T	P	C
3	0	0	3

English-I

(Common to all Branches)

Internal Marks: 40

Course Code: P18HST01 **External Marks: 60**

Course Prerequisite: The students should have basic knowledge of English grammar and LSRW skills.

Course Objectives:

1. To enable the engineering students to develop their basic communication skills in English for academic and social purposes.
2. To equip the students with appropriate oral and written communication skills.
3. To inculcate the skills of listening, reading and critical thinking.
4. To integrate English Language learning with employability skills and training.
5. To enhance the students' proficiency in reading skills enabling them meet the academic demands of their course

Course Outcomes:

On completion of this course, the student is able to:

1. Use English Language effectively in spoken and written forms
2. Interpret the contextual meaning of words
3. Comprehend the given texts and respond appropriately
4. Recall and reproduce the theme in a given context
5. Communicate confidently in formal and informal contexts

UNIT – I (9 Lectures)

The Happy Prince – Oscar Wilde

a. Vocabulary: Synonyms and Antonyms
(http://www.magickeys.com/books/riddles/words.html)

b. Grammar: Prepositions, Sentence structure & Types of sentences

c. Writing: Note Making and Note Taking

UNIT – II (8 Lectures)

Technology with a Human Face – E.F.Schumacher

a. Vocabulary: One word substitutes & Idioms

b. Grammar: Subject–verb Agreement (Concord), Question tags and Modal Auxiliaries

c. Writing: Information Transfer

UNIT –III (9 Lectures)

Presidential Address – APJ Abdul Kalam

a. Vocabulary: Word formation, Root Words
(www.englishhints.com,www.enchantedlearning.com,
www.learnenglish.de/grammar/prefixtext.html)

b. Grammar: Parts of Speech, Punctuation

c. Writing: Paragraph Writing

UNIT- IV (9 Lectures)

The Road Not Taken – Robert Frost

a. Vocabulary: Prefixes, Suffixes and Affixes
(http://www.magickeys.com/books/riddles/words.html)

b. Grammar: Articles

c. Writing: Letter Writing

UNIT – V (10 Lectures)

Good Manners – J.C Hill

a. Vocabulary: Homonyms, Homophones and Homographs
(http://www.pinnacle.edu.in/campusfiles/1826_campusFile_1.pdf)

b. Grammar: Tenses

c. Writing: E- mail Writing

Text books:

1. New Horizons – Pearson Publishers
2. Fluency in English", A Course Book for Engg. Students, Published by Orient Black Swan, Hyderabad, 2016 print.
3. "Technical Communication- Principles and Practice", Third Edition. New Delhi: Oxford University press.

Reference Books:

1. Meenakshi raman, Sangeetha, Sharma Fundamentals of technical communication, Pg:
   119-153 Oxford University press, 2015
2. Rutherford, Andhrea. J, Communication skills for technology. Pearson, New Delhi.2001
3. Raymond Murphy, Murphy's English Grammar, Cambridge University Press 2004
4. Meenakshi raman, Sangeetha, Sharma,Technical communication: English Skills for
   Engineers, Oxford University press, 2009
5. Michael Swan, Practical English Usage, Oxford University press, 1996

Web References:

1. www.englishhints.com
2. www.enchantedlearning.com
3. www.learnenglish.de/grammar/prefixtext.html
4. http://www.magickeys.com/books/riddles/words.html
5. http://www.pinnacle.edu.in/campusfiles/1826_campusFile_1.pdf
6. http://www.yourdictionary.com
7. http://www.learnenglish.com
8. http://www.cambridge.org
9. http://www.eslcafe.com
10. http://www.eslgames.com
11. http://www.penguin.co.uk
12. http://www.edufind.com/english/practice

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B. Tech- I Year I Semester **Course structure**

L	T	P	C
3	0	0	3

MATHEMATICS-I
(Differential equations and Laplace Transforms)

(Common to All Branches)

Internal Marks: 40

Course code: P18BST01 **External marks: 60**

Course Prerequisite: The basic knowledge of Matrices, Trigonometry, Differentiation and Integration.

Course Objectives:

1. To learn the methods solving the differential equations of first order with their applications.
2. To learn the methods of solving differential equations of second and higher order with their applications .
3. To learn to find the Laplace transform of different functions and obtained the solution of Design.
4. To understand the concepts Partial Differential.

Course Outcomes: After learning the contents of this paper the student must be able to

1. Solve first order differential equations and their applications.
2. Usage of higher order differential equations that are applied to real world problems.
3. Find the Laplace transform of derivatives, integrals and periodic functions.
4. Use the method of Laplace transforms to solve systems of linear first-order differential equations.
5. Calculate total derivative, Jacobian, Maxima and minima of functions of two variables.

UNIT-I: (11 Lectures)

Differential equations of first order and first degree:

Linear-Bernoulli-Exact-Reducible to exact.

Applications: Newton's Law of cooling-Law of natural growth and decay-Orthogonal trajectories.

UNIT-II: (9 Lectures)

Linear differential equations of higher order:

Non-homogeneous equations of higher order with constant coefficients with RHS term of the type e^{ax},sin ax, cos ax, polynomials in x, e^{ax}V(x), xV(x)- Method of Variation of parameters.

Applications: LCR circuit.

UNIT-III: Laplace Transforms: (10 Lectures)

Laplace transforms of standard functions– First shifting Theorem, Change of scale property, Multiplication by t^n, division by t, Transforms of derivatives and integrals – Second shifting theorem– Laplace transform of Periodic functions.

UNIT IV: Inverse Laplace Transforms: (8 Lectures)

Inverse Laplace transforms – Convolution theorem.

Application of Laplace transforms to ordinary differential equations of first and second order.

UNIT V: Partial Differentiation: (10 Lectures)

Introduction- Homogeneous function-Euler's theorem-Total derivative-Chain rule-Generalized Mean value theorem for single variable (without proof)-Taylor's and Mc Laurent's series expansion of functions of two variables– Functional dependence-Jacobian.

Applications: Maxima and Minima of functions of two variables without constraints and Lagrange's method (with constraints).

Text Books:

1. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2. N.P.Bali, Engineering Mathematics, Lakshmi Publications.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India
2. Micheael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearson edn
3. Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press
4. Peter O'neil, Advanced Engineering Mathematics, Cengage Learning.
5. Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
6. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.

Web References:

1. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
2. http://mathworld.wolfram.com/topics
3. http://www.nptel.ac.in/course.php

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B.Tech I Year - I Semester

Course structure

L	T	P	C
3	0	0	3

C - Programming for Problem Solving

(Common to all Branches)

Course Code: P18EST03 **Internal Marks: 40**

External Marks: 60

Course Prerequisite: Nil

Course Objectives:

1. To impart adequate knowledge on the need of programming languages and problem solving techniques.
2. To impart problem solving skills.
3. To enable student to write programs in C and to solve the problems.

Course Outcomes:

At the end of this course the student will be able to

1. Design algorithms and flowchart / Pseudo code for a given problem.
2. Design programs involving decision structures and loops.
3. Implement different operations on arrays and solve problems using functions.
4. Understand pointers and strings.
5. Implement structures, unions and file operations in C programming for a given application problem.

Unit-I: (8 Lectures)

Introduction to Programming: Computer hardware, Bits and Bytes, programming languages, application and system software, the software development process.

Idea of algorithm: steps to solve logical and numerical problems. Representation of algorithm: flowchart/pseudo code with examples, from algorithms to programs.

Unit-II: (9 Lectures)

Introduction to C: Overview of C, Constants, Variables and Data Types, Operators and Expressions, Managing Input and Output. Decision Making - Branching and Looping. Enumerated Data type, Renaming Data type with typedef, Type Casting.

UNIT-III (12 Lectures)

Arrays: Definition, Declaration, Initialization, Assignment, Processing array, Passing array to a function, Two and multi dimensional array.

Functions: Defining a function, Accessing a function, Passing argument to functions, Function prototypes, Nested function call, Storage classes.

UNIT-IV (10 Lectures)

Pointers: Definition, initialization, operations on pointers, functions and pointers, arrays and pointers, pointers to pointers, dynamic memory allocation.

Strings: C Strings, String Input / Output functions, arrays of strings, string manipulation functions.

UNIT-V (9 Lectures)

Structures: Definition, declaration, initialization, accessing members, array of structures, arrays within structure, functions and structures, pointers to structures, nested structures, unions.

File Handling: Types, operations on files, modes, file I/O functions, Random Access Functions.

Text Books:

1. Byron S Gottfried, —Programming with C, Schaums Outlines, Second Edition, Tata McGraw-Hill, 2006.
2. Problem Solving and Program Design in C, 4th edition, by jeri R. Hanly and Elli B.Koffman.
3. Balagurusamy. 2011. C Programming. Tata Mc Graw Hills, New Delhi, India.

Reference Books:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
2. Yashavant P. Kanetkar. —Let Us C, BPB Publications, 2011.

Web References:

1. https://www.studytonight.com/c/
2. https://www.cprogramming.com/tutorial/c-tutorial.html
3. https://www.javatpoint.com/c-programming-language-tutorial
4. https://www.tutorialspoint.com/cprogramming/

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B.Tech. I Year I Semester **Course Structure**

L	T	P	C
3	0	0	3

APPLIED PHYSICS

(Common to ECE, CSE & IT)

Internal Marks: 40

Course code: P18BST03 **External Marks: 60**

Course Prerequisites

The basics of analytical and conceptual understanding of physics.

Course Objectives

1. To study the wave nature of light through Interference and diffraction.
2. To learn the basic principles of Lasers and fiber optics.
3. To express the physics of electrostatics and electromagnetic wave concepts through Maxwell's equations.
4. To study the basic concepts of Quantum mechanics.
5. Aware of limits of classical free electron theory and apply band theory of solids.
6. Acquire the knowledge of semiconductor physics.

Course Outcomes

1. Understanding the basic concepts of optics and how to apply them for engineering applications.
2. Acquire the knowledge of fundamentals of Lasers and fiber optics enables the students to develop Laser devices to apply them in various systems like communications, Industries and medicine.
3. Set students to be exposed to Electrostatics, Maxwell's equations, electromagnetic waves and fundamental concepts of quantum mechanics.
4. Enable to learn the fundamental concepts of free electron theory and band theory of solids.
5. Develop knowledge of band theory of solids for fundamentals of Semiconductor physics enables the students to apply the knowledge to various systems like communications, solar cell, photo cells and so on.

UNIT-I

Wave Optics (10 lectures)

Interference: Introduction, Superposition of waves, Interference of light by wave front splitting and amplitude splitting, interference in thin films, Newton's rings.

Diffraction: Introduction, differences between interference and diffraction, difference between Fraunhoffer and Fresnel diffraction, Fraunhoffer diffraction at single slit,

Diffraction grating (N-slits qualitative), diffraction at circular aperture, resolving power of microscope, and telescope.

UNIT-II

LASERS AND FIBER OPTICS (9 lectures)

Lasers: Introduction, Characteristics of laser, Absorption, spontaneous emission, stimulated emission, Einstein's coefficients, Pumping, Types of Lasers: Ruby laser, He-Ne laser.

Fiber optics: Introduction, Total internal reflection-wave propagation in optical fiber, Acceptance angle, numerical aperture.

UNIT-III (9 lectures)

Electrostatics, Maxwell's Equations And Electromagnetic Waves

Electrostatics: Coulombs law, electric field, electric field intensity, electric flux Density, electrostatic potential, divergence of electric field, Laplace's and Poisson's equations for electrostatic potential, Gauss theorem in electrostatics.

Maxwell's equations and electromagnetic waves: Gauss theorem in magneto statics, Faraday's law of electromagnetic induction, Ampere's law, displacement current, Maxwell's equations in vacuum, electromagnetic wave equation in dielectric medium, velocity of propagation of electromagnetic wave, poynting vector and poynting theorem.

UNIT-IV (12 lectures)

Quantum Mechanics, Free Electron Theory And Band Theory

Quantum Mechanics: Introduction to quantum physics, de-Broglie's hypothesis and properties of matter waves, Schrodinger's time independent wave equation, Particle in one dimensional box, physical significance of wave function.

Free electron theory: Free electron theory of metals assumptions and failures, Fermi Dirac distribution function- Fermi level, density of states.

Band theory of solids: Introduction, Bloch's theorem, Kronig penny model(qualitative), E-K diagram, Brillouin's zones, classification of solids into metals, semiconductors and insulators, effective mass of electron and concept of hole

UNIT-V (8 lectures)

Semiconductor Physics

Semiconductor physics: Introduction**,** Intrinsic and Extrinsic semiconductors. carrier concentration in intrinsic semiconductors, carrier concentration in N-type and P-type semiconductors, Dependence of Fermi energy on carrier-concentration and temperature, diffusion and drift, Hall effect and its applications, mechanism in LED, solar cell and photo conductor

Text Books:

1. A Textbook of Engineering Physics by Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - S. Chand.
2. Optics by Ajoy Ghatak, Tata McGraw-Hill Publishing company limited

3. Lasers and nonlinear optics by BB Laud, New age International Publishers
4. Introduction to Electrodynamics by David Griffiths, Cambridge University Press
5. Introduction to Quantum physics by Eisberg and Resnick.
6. Solid state physics by AJ Dekker.

Reference Books:

1. Applied physics by Palanisamy (Scitech publications)
2. Optics by Eugene Hecht, Pearson Education.
3. Principle of Lasers by O.Svelto
4. Electricity, magnetism and light by W. Saslow
5. Introduction to Quantum mechanics by D.J.Griffiths. Cambridge University Press
6. Quantum mechanics by Richard Robinett.
7. Quantum Chemistry by Daniel McQuarrie
8. Semiconductor Optoelectronics by J. Singh, Physics and Technology, Mc Graw-Hill inc
9. Engineering Physics by B.K. Pandey, S. Chaturvedi - Cengage Learing.
10. Physics by Halliday and Resnick

Web References:

1. http://jntuk-coeerd.in/
2. http://www.youtube.com
3. http://en.wikipedia.org
4. http://nptel.ac.in/syllabus/122106027/

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B.Tech I Year I Semester **Course Structure**

L	T	P	C
1	0	3	2.5

ENGINEERING GRAPHICS

(Common to EEE,ECE,CSE,IT Branches)

Internal Marks: 40

Course Code: P18EST02 **External Marks: 60**

Course Prerequisite: Nil

Course objectives:

1. To introduce the students to the "universal language of Engineers" for effective communication through drafting exercises.
2. To enable the students to acquire requisite knowledge, techniques and attitude required for advanced study of engineering drawing.
3. To enable the students to construct the layout development of basic solids for practical situations.
4. To enable the students to gain the ability to convert the Isometric views in to Orthographic views.
5. To enable the students to gain the ability to convert the Orthographic views in to Isometric views.

Course Outcomes:

After completion of the course the student will be able to

1. Gain the knowledge of various Geometrical Elements used in Engineering Practice.
2. Understand concepts of all 2 D elements like polygons, Conic Sections.
3. Understand concepts of 3 D Objects like various Prisms, Cylinders, Pyramids and Cones.
4. Draw and represent the Projections of various objects.
5. Convert the 3 D views in to 2 D views and vice versa.

UNIT-I: (12 Lectures)

Introduction To Engineering Graphics

Introduction to Drawing instruments and their uses, construction of regular polygons, Conic sections- ellipse, parabola, hyperbola using general method, Scales- Diagonal scale, Vernier scale.

UNIT-II: (12 Lectures)

Projections Of Points & Lines

Principle of orthographic projection-Method of Projection – First and third angle projection methods- Projections of Points –Projection of straight lines- parallel to one plane and inclined to the other plane.

UNIT-III: (16 Lectures)

Projections of Lines & Planes

Projections of straight lines inclined to both the planes, determination of true lengths, angle of inclinations and traces.

Projections of Planes: Projections of plane figures: triangle, square, rectangle, pentagon and hexagon, circle with surfaces inclined to both the reference planes.

UNIT-IV: (12 Lectures)

Projections of Solids & Surface Development

Projections of Solids: Projections of regular solids with the axis inclined to only one reference plane.

Development of surfaces for basic solids- prisms, pyramids, cylinder and cone.

UNIT – V: (12 Lectures)

Projections Of Pictorial Views

Conversion of isometric views into orthographic views and conversion of orthographic views in to isometric views.

Text Book:

1. Engineering Drawing by N.D. Bhatt & V.M. Panchal, Charotar Publications, 2014.
2. Engineering Drawing by Basant Agrawal and C.M. Agrawal ,McGraw Hill Education Pvt. Limited, 2013.
3. Engineering Drawing by Prof.K.L.Narayana & Prof. R.K.Kannaiah, Scitech Publications, 2010.

Reference Book:

1. Engineering Graphics with AutoCAD 2002 by James D. Bethune, PHI, 2011.
2. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd, 2010.
3. Engineering drawing – P.J. Shah .S.Chand Publishers, 2010.
4. Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers, 2010.
5. Engineering Drawing – M.B. Shah and B.C. Rana, Pearson, 2009.

Web References:

1. https://lecturenotes.in/subject/436/engineering-drawing-ed.
2. web.iitd.ac.in/~achawla/public_html/201/lectures/sp46.pdf.
3. https://www.smartzworld.com/notes/engineering-drawing-pdf-1st-year-notes-ppts
4. https://www.researchgate.net/305754529_A_Textbook_of_Engineering_Drawing
5. www.academia.edu/32510080/N_d_bhatt_engineering_drawing_pdf

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B.Tech. I Year I Semester **Course Structure**

L	T	P	C
0	0	3	1.5

English Language Communication Skills Lab

(Common to EEE,ME,ECE,CSE,IT,AME Branches)

Internal Marks: 40

Course Code: P18HSL01 **External Marks: 60**

Course Prerequisite:

1. Basic knowledge of English grammar
2. Basic understanding of English vocabulary.
3. Ability to speak simple sentences.
4. Have interest to learn the language

Course Objectives

1. To facilitate computer assisted multimedia instructions enabling individualized and independent language learning.
2. To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm.
3. To bring about a consistence accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking.
4. To improve the fluency of students in spoken English and neutralize their mother tongue influence.
5. To train students to use language appropriately for public speaking, group discussion and interviews.

Course Outcomes

1. Better understanding of nuances of English language through audio visual experience and group activities.
2. Neutralization of accent for intelligibility.
3. Speaking skills with clarity and confidence which in turn enhances their employability skills.
4. Better understanding of the production of sounds of language.
5. Suitable body language for employability.

Scope:

The curriculum of the **ELCS Lab** is designed to focus on the production and practice of sounds of language and to familiarize the students with the use of English in everyday situations and contexts.

EXERCISE – I (3 Sessions)

- **A.** Ice – Breaking Activity, Greeting, Introducing and taking leave
- **B.** Introduction to Phonetics

  Vowel sounds – Pure Vowels & Diphthongs

  Consonant sounds

EXERCISE – II (2 Sessions)

- **A.** JAM Session, Situational Dialogues, Giving Directions & Narration
- **B.** Structure of Syllables - Plural markers & Past tense Markers

EXERCISE – III (2 Sessions)

- **A.** Role play, Giving Information and Asking Information
- **B.** Word Stress & Listening Comprehension – Listening for General Details

EXERCISE – IV (2 Sessions)

- **A.** Describing objects, events, places etc. & Presentation Skills – Extempore, Public Speaking.
- **B.** Consonant Cluster, Rules of 'r' pronunciation and Neutralization of Mother Tongue Influence

EXERCISE – V (3 Sessions)

- **A.** Interview Skills & Group Discussion
- **B.** Intonation & Listening Comprehension – Listening for Specific Details

Textbooks:

1. Strengthen your Communication Skills - Maruthi Publication, Hyderabad 2013
2. A textbook of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)

Reference Books:

1. INFOTECH English (Maruthi Publications).
2. Personality Development and Soft Skills (Oxford University Press, New Delhi)
3. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation
4. Speaking English Effectively 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
5. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
6. Hancock, M. 2009. English Pronunciation in Use. Intermediate. Cambridge: CUP
7. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad
8. Hewings, M. 2009. English Pronunciation in Use. Advanced. Cambridge: CUP
9. Marks, J. 2009. English Pronunciation in Use. Elementary. Cambridge: CUP
10. Nambiar, K.C. 2011. Speaking Accurately. A Course in International Communication. New Delhi : Foundation
11. Soundararaj, Francis. 2012. Basics of Communication in English. New Delhi: Macmillan
12. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
13. English Pronouncing Dictionary Daniel Jones Current Edition with CD.

Web References:

1. http://www.cambridge.org
2. http://www.edufind.com/english/practice
3. http://www.learnenglish.com
4. http://www.penguin.co.uk

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B.Tech. I Year I Semester

Course Structure

L	T	P	C
0	0	3	1.5

C - Programming for Problem Solving Lab
(Common to all Branches)

Course Code: **P18ESL03**

Internal Marks: 40
External Marks: 60

Course Prerequisite: Nil

Course Objectives:

1. To understand the various steps in program development.
2. To understand the basic concepts in C Programming Language.
3. To understand different modules that includes conditional and looping expressions.
4. To understand how to write modular and readable C Programs.
5. To write programs in C to solve problems using arrays, structures and files.

EXPERIMENT WISE PROGRAMS

Experiment-1

a) Write a simple C program to Print "Hello World"
b) Write a simple C Program to Calculate Area and Circumference of Circle
c) Write a simple C program to implement basic arithmetic operations - sum, difference, product, quotient and remainder of given numbers.

Experiment-2

Write C programs to demonstrate the following operators

a) Assignment Operator.
b) Relational and Logical Operator.
c) Increment and decrement operator.
d) Bitwise operators.
e) Ternary operator.

Experiment-3

a) Write a C programs - to find the largest and smallest of 2 numbers(if – else), to find the largest and smallest of 3 numbers(Nested if – else), roots of quadratic equation(else – if ladder).
b) The total distance travelled by vehicle in't' seconds is given by distance=ut+1/2at2 where 'u' and 'a' are the initial velocity and acceleration. Write a c program to find the distance travelled at regular intervals of time given the Values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

c) Write a c program, which takes two integer operands and one operator from the user, performs the operation and the prints the result. (consider the operators +,-,*,/,% and use switch statement).

Experiment-4

a) Write a C program to find the sum of individual digits of a positive integer
b) A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1.Subsequent terms are found by adding the preceding two terms in the sequence .Write a c program to generate the first n terms of the sequence.
c) Write a c program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Experiment-5

a) Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:
$1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$.
b) Write a C program to generate Pascal's triangle.
c) Write a C program to construct a pyramid of numbers

Experiment-6

a) Write a c program to find both the largest and smallest number in a list of integers.
b) Write a c program that uses functions to perform the following:
    i) Addition of Two Matrices.
    ii) Multiplication of Two Matrices.

Experiment-7

a) Write a programs that use both recursive and non-recursive functions
b) To find the factorial of a given integer.
c) To find the GCD of two given integers.

Experiment-8

a) Write a c program that uses functions to perform the following operations:
    i) To insert a sub-string in given main string from a given position.
    ii) To delete n Characters from a given position in a given string.
b) Write a C program to determine if the given string is a palindrome or not.

Experiment-9

a) Write a C program that displays the position or index in the string S Where the string T begins, or - 1 if S doesn't contain T.
b) Write a C program to count the lines, words and characters in a given text .

Experiment-10

a) Write a program to print the details of a student like(Name, Rollno, marks) using nested structures.
b) Write a C Program to Calculate Difference Between Two Time Period.

Experiment-11

a) Write a C program that uses functions to perform the following operations:
   i) Reading a complex number
   ii) Writing a complex number
   iii) Addition of two complex numbers
   iv) Multiplication of two complex numbers
   (Note: represent complex number using a structure.)

Experiment-12

a) Write a C program which copies one file to another and display the contents of a file
b) Write a C program to reverse the first n characters in a file.
c) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)

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B.Tech. I Year I Semester

Course Structure

L	T	P	C
0	0	3	1.5

APPLIED PHYSICS LAB

(Common to ECE, CSE & IT)

Internal Marks: 40

Course code: P18BSL01 **External Marks: 60**

Course Prerequisites:

The basics of analytical and conceptual understanding of physics.

Course Objective:

1. Deploy scientific method of experiments in the laboratory.
2. Develop the procedures and observational skills for appropriate use of simple and complex apparatus.
3. Enable analytical techniques, statistical analysis and graphical analysis.
4. Reinforce ideas and concepts covered in lecture host of experiments.
5. Train to find the radius of curvature of a Plano-convex lens forming Newton's rings.

Course Outcomes:

1. Apply the phenomenon of interference and diffraction of light waves.
2. Implement the concept of resonance in LCR circuit and Sonometer.
3. Analyze the SHM to determine its dependent properties.
4. Evaluate the behavior of electronic components and its characteristics.

List of Experiments

(Any eight of the following to be done)

1. Determination of Radius of Curvature of Plano - Convex lens by forming Newton's Rings.
2. Determination of Wavelengths of various spectral lines using diffraction grating with the normal incidence method.
3. Determination of wavelength of laser radiation.
4. Determination of Refractive index of a given prism..
5. Study of magnetic field along the axis of a current carrying coil and to verify Stewart-Gee's method.
6. Determination of energy gap of PN junction Diode.
7. Determination of hall coefficient and carrier concentration using Hall effect
8. Study of V-I characteristics of Zener diode.
9. Study of V-I characteristics of PN junction diode.
10. Determination of frequency of a vibrating bar or electrical tuning fork using Melde's apparatus.
11. Determination of acceleration due to gravity using compound pendulum

12. Verification of laws of transverse waves by Sonometer.
13. Determination of Velocity of sound by volume resonator.
14. Determination of rigidity modulus by Torsional Pendulum.

Text Books:

1. Madhusudhanrao, "Engineering Physics lab manual" Ist edition,Scietech Publication, 2015.
2. Ramarao Sri, Choudary Nityanand and Prasad Daruka, Lab Manual of Engineering physics 5th ed, Excell books, 2010.
3. Physics lab manual, department of physics, PACE Institute of Technology and Sciences.

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B. Tech- I Year I Semester

Course structure

L	T	P	C
0	0	3	1.5

ENGINEERING WORKSHOP

(Common to EEE,ECE,CSE,IT branches)

Internal Marks: 40

Course Code: P18ESL02 **External Marks: 60**

Course Pre-requisite: Nil

Course Objectives:

1. To provide hands on experience about use of different engineering materials, tools, equipment and processes those are common in the engineering field.
2. To provide the students hands on experience to make different joints in carpentry with hand tools like jack plane, various chisels & hand saws.
3. To provide the students hands on experience to make different joints in Sheet metal work with hand tools like snips, stacks, nylon mallets etc.
4. To provide the students hands on experience to make different connections in house wiring with hand tools like cutting pliers ,tester ,lamps& lamp holders etc.
5. To develop a right attitude, team working, precision and safety at work place.

Course Outcomes:

At the end of the course the student will be able to

1. Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.
2. Familiarize with the basics of tools and equipment used in Carpentry.
3. Fabricate various basic components using Sheet metal.
4. Apply basic electrical engineering knowledge for house wiring practice.
5. Gain the hands on experience to form different models in Black smithy.

LIST OF EXPERIMENTS:

Minimum two experiments should be conducted from each trade

1. **Carpentry** **(6 Lectures)**
   a) Cross-Lap joint
   b) Dove tail joint
   c) T - Lap joint
   d) Mortise & Tenon joint
2. **Fitting** **(6 Lectures)**
   a) Square fit

b) V - Fit
c) Half round fit
d) Dovetail fit

3. **Tin Smithy** **(6 Lectures)**
   a) Rectangular Tray
   b) Cylinder
   c) Square box without lid
   d) funnel
4. **Black Smithy** **(6 Lectures)**
   a) Round rod to Square
   b) S-Hook
   c) Round Rod to Flat Ring
   d) Round Rod to Square headed bolt
5. **House wiring** **(6 Lectures)**
   a) One lamp controlled by one switch
   b) Parallel and Series connections
   c) Fluorescent lamp fitting
   d) Stair case wiring

Reference Books:

1. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers, 2015.
2. Engineering Practices Lab Manual, Jeyapoovan, SaravanaPandian, Vikas publishers, 2009.
3. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House, 2003.

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B.Tech. I Year II Semester **Course Structure**

L	T	P	C
3	0	0	3

English-II

(Common to all Branches)

Internal Marks: 40

Course Code: P18HST02 **External Marks: 60**

Course Prerequisite: The students should have basic knowledge of English grammar and LSRW skills.

Course Objectives:

1. To enable the engineering students to develop their basic communication skills in English for academic and social purposes.
2. To equip the students with appropriate oral and written communication skills.
3. To inculcate the skills of listening, reading and critical thinking.
4. To integrate English Language learning with employability skills and training.
5. To enhance the students' proficiency in reading skills enabling them meet the academic demands of their course

Course Outcomes:

On completion of this course, the student is able to:

1. Use English Language effectively in spoken and written forms
2. Interpret the contextual meaning of words
3. Comprehend the given texts and respond appropriately
4. Recall and reproduce the theme in a given context
5. Communicate confidently in formal and informal contexts

UNIT – I (8 Lectures)

My Struggle for an Education – Booker T. Washington

a. Vocabulary: Collocations

b. Grammar: Finite verbs, Non- finite verbs, Gerund, Transitive and Intransitive Verbs

c. Writing: Precis Writing

UNIT – II (9 Lectures)

In London – M.K.Gandhi

a. Vocabulary: Commonly confused words

b. Grammar: Active voice and Passive voice

c. Writing: Technical Report Writing

UNIT –III (10 Lectures)

Principles of Good Writing – L A Hill

a. Vocabulary: Commonly Misspelt Words

b. Grammar: Direct & Indirect Speech

c. Writing: Essay Writing

UNIT- IV (9 Lectures)

The Secret of Work – Swami Vivekanada

a. Vocabulary: Technical vocabulary

b. Grammar: Degrees of Comparison

c. Writing: Curriculum vitae, Cover Letter and Resume Writing. (Functional, Chronological and standard Resumes)

UNIT – V (9 Lectures)

Oh Father Dear Father – Raj Kinger

a. Vocabulary: Phrasal verbs

b. Grammar: Simple, Compound and Complex Sentences

c. Writing: Hints Development

Textbooks:

1. Board of Editors, "Sure Outcomes"– Orient Blackswan, Hyderabad, 2013
2. "Panorama" – Oxford University Press, New Delhi, 2016
3. "Fluency in English", A Course Book for Engg. Students, Published by Orient Black Swan, Hyderabad, 2016 print.
4. "Technical Communication- Principles and Practice", Third Edition. New Delhi: Oxford University press.

Reference Books:

1. Murphy, "English Grammar with CD", Cambridge University Press, New Delhi, 2004.
2. Rizvi Asheaf M, "Effective Technical Communication", Tata McGraw Hill, New Delhi, 2008.
3. Baradwaj Kumkum, Professional Communication", I.K. International- Principles and Practice". Third Edition. New Delhi: Oxford University Press.2015.
4. Trailblazers – Board of Editors – Orient Blackswan New Delhi.

Web References:

1. www.englishhints.com,www.enchantedlearning.com, www.learnenglish.de/grammar/prefixtext.html
2. http://www.magickeys.com/books/riddles/words.html
3. http://www.pinnacle.edu.in/campusfiles/1826_campusFile_1.pdf
4. http://www.yourdictionary.com
5. http://www.learnenglish.com
6. http://www.cambridge.org
7. http://www.eslcafe.com
8. http://www.eslgames.com
9. http://www.penguin.co.uk
10. http://www.edufind.com/english/practice

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B. Tech- I Year II Semester **Course structure**

L	T	P	C
3	0	0	3

MATHEMATICS-II
(Linear algebra and Vector calculus)
(Common to All Branches)

Internal Marks: 40
Course code: P18BST02 **External marks: 60**

Course Prerequisite: Mathematics-I (P18BST01)

Course Objectives: To learn

1. The subject gives the knowledge about matrices and applications to solve linear equations.
2. The course intends to provide an overview of Eigen values and Eigen vectors which occur in Physical and engineering problems.
3. To integration over the regions.
4. The concepts of vector differentiation.
5. Line integral, Surface and volume integrals, Vector integral theorems.

Course Outcomes: After learning the contents of this paper the student must be able to

1. Apply this knowledge to solve linear equations.
2. Eigen values and Eigen vectors of a given matrix and solve simultaneous linear equations.
3. Determine double integral over a region and triple integral over a volume.
4. Analyze the Vector differentiation in various domains.
5. Evaluate the line, surface and volume integrals and converting them from one to another.

UNIT I: Linear systems of equations: (10 Lectures)
Rank-Echelon form-Normal form – Solution of linear systems – Gauss elimination – Gauss Jordon- Gauss Jacobi and Gauss Seidal methods.
Applications: Finding the current in electrical circuits.

UNIT II: Eigen values - Eigen vectors and Quadratic forms: (10 Lectures)
Eigen values - Eigen vectors– Properties – Cayley-Hamilton theorem - Inverse and powers of a matrix by using Cayley-Hamilton theorem- Diagonalization- Quadratic forms-Reduction of quadratic form to canonical form – Rank - Positive, negative and semi definite - Index – Signature.

UNIT III: Multiple integrals: (9 Lectures)
Double and triple integrals – Change of variables – Change of order of integration.
Applications: Finding Areas, surface areas and Volumes.

UNIT IV: Vector Differentiation: (10 Lectures)

Gradient-Directional derivative, Divergence- Solenoidal vector, Curl –Irrotational Vector, Vector identities.

Applications: Equation of continuity, potential surfaces.

UNIT V: Vector Integration: (9 Lectures)

Line integral – Work done – Potential function – Area- Surface and volume integrals Vector integral theorems: Greens, Stokes and Gauss Divergence theorems (without proof) and related problems.

Applications: Work done, Force.

Text Books:

1. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2. N.P.Bali, Engineering Mathematics, Lakshmi Publications.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India
2. Micheael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearson edn
3. Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press
4. Peter O'neil, Advanced Engineering Mathematics, Cengage Learning.
5. Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
6. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.

Web References:

1. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
2. http://mathworld.wolfram.com/topics
3. http://www.nptel.ac.in/course.php

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B.Tech I Year - II Semester **Course structure**

L	T	P	C
3	0	0	3

PYTHON PROGRAMMING
(Common to EEE,ME,ECE,CSE,IT,AME Branches)

Course Code: P18EST04 **Internal Marks: 40**
External Marks: 60

Course Prerequisite: **Nil**

Course Objectives:

1. To read and write simple Python programs.
2. To develop Python programs with conditionals and loops.
3. To define Python functions and apply OOP concept.
4. To use Python data structures –- lists, tuples, dictionaries.
5. To develop GUI applications in Python.

Course Outcomes:

At the end of this course, the students will be able to

1. Understand the basics of python programming.
2. Understand control flow and implement various data structures provided by python.
3. Implement packages, methods and functions.
4. Develop real-world applications using oops and exception handling.
5. Build GUI Applications in Python.

UNIT-I (9 Lectures)

Introduction: History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

UNIT-II (10 Lectures)

Types, Operators and Expressions: Types - Integers, Strings, Booleans, Expressions and order of evaluations, Control Flow- if, if-elif-else, for, while, break, continue, pass.

Data Structures Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences, Comprehensions.

UNIT III (11 Lectures)

Functions - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions(Function Returning Values), Scope of the Variables in a Function - Global and Local Variables.

Modules: Creating modules, import statement, from. Import statement, name spacing,

Python packages: Introduction to PIP, Installing Packages via PIP, Using Python Packages

UNIT IV (9 Lectures)

Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, Data hiding.

Error and Exceptions: Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions.

UNIT V (9 Lectures)

Brief Tour of the Standard Library & Files - Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics, file operations.

Text Books

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist'', 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (http://greenteapress.com/wp/thinkpython/).
2. Guido van Rossum and Fred L. Drake Jr, "An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

Reference Books

1. John V Guttag, "Introduction to Computation and Programming Using Python'', Revised and expanded Edition, MIT Press , 2013
2. Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012.
3. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
4. Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem Solving Focus, Wiley India Edition, 2013.

Web References:

1. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/
2. https://www.codecademy.com/learn/learn-python
3. https://www.codementor.io/collections/learn-python-bwbc63ulz
4. http://www.diveintopython3.net/
5. https://www.python.org/3/
6. https://www.learnpython.org

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B.Tech I Year II Semester **Course Structure**

L	T	P	C
3	0	0	3

APPLIED CHEMISTRY
(for ECE,CSE,IT Branches)

Internal Marks: 40
Course Code: P18BST05 **External Marks: 60**

Course Prerequisite: Basic Chemistry at Intermediate or equivalent level.

Course Objectives

1. In this course. Student will learn the concepts and applications of chemistry in engineering.
2. It aims at strengthening the students with the fundamental concepts of chemistry. Plastics are nowadays used in household appliances; also they are used as composites (FRP) in aerospace industries.
3. It enables the students to know analysis of Advanced materials and used in diverse fields.
4. It makes the students to effectively use of electro chemistry, battery technology, and corrosion science in engineering applications
5. It enables the students to Spectroscopic techniques and applications.

Course Outcomes:

After completion of course student will be able to

1. The advantages and limitations of plastic materials and their use in design would be understood.
2. Analyze the different types of electrodes and batteries for technological applications.
3. To understand the 3D structure of the organic molecules.
4. Analyze the structure of the chemical compounds.
5. The students would aware of materials like nanomaterials, liquid crystals, green chemistry.

UNIT I: **(10 Lectures)**

High Polymers And Plastics

Polymerization: Introduction, classification, types of polymerization, Stereo regular polymers, Methods of polymerization (emulsion and suspension), Physical and mechanical properties.

Plastics as engineering materials: Advantages and limitations, Thermoplastics and Thermosetting plastics, Compounding and fabrication (4/5 techniques), Preparation, properties and applications of poly ethene, PVC, Bakelite and Teflon.

Elastomers: Natural rubber, compounding and vulcanization, Synthetic rubbers : Buna S, Buna N, Thiokol- preparation ,properties and applications, applications of elastomers. Composite materials & Fiber reinforced plastics, Conducting polymers.

UNIT II: **(10 Lectures)**

Electrochemistry And Corrosion

Introduction, Single electrode potential**,** EMF, Galvanic cell, Nernst equation and applications. Reference Electrodes-SHE, calomel electrode. Electro chemical series and uses of this series, Concentration cells

Batteries: Introduction, Types: Dry Cell, Ni-Cd Cells, Pb-acid storage cells, Li ion cells.

Corrosion: Causes Theories of Corrosion (chemical and Electro chemical), types-galvanic, differential aeration, stress corrosion, corrosion control methods– material selection and designing aspects, Cathode protection – sacrificial anodic protection and impressed current cathode. Galvanizing, Tinning, Electroplating of Copper and electro less plating of nickel.

UNIT III: (**10 Lectures)**

Stereochemistry

Representations of 3 dimensional structures, structural isomers and stereoisomers, configurations and symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis. Isomerism in transitional metal compounds.

UNIT-IV: **(10 Lectures)**

Spectroscopic Techniques And Organic Synthesis Of Drug Molecule

Principles of spectroscopy and selection rules. Electronic spectroscopy. Vibrational and rotational spectroscopy. Basic concepts of Nuclear magnetic resonance spectroscopy, chemical shift. Introduction to Magnetic resonance imaging.

Synthesis of commonly used drug molecules- Ibuprofen, Aspirin, Paracetamol.

UNIT -V: **(8 Lectures)**

Chemistry of Advanced Materials

Nano materials:- Introduction – Sol-gel method & chemical reduction method of preparation – Characterization by BET method and TEM methods - Carbon nanotubes and fullerenes: Types, preparation, properties and applications.

Liquid crystals: - Introduction, Types, Applications.

Super conductors: Introduction, Type-I & Type-II super conductors, properties and applications.

Green Chemistry: - Principles, 3or 4 methods of synthesis with examples and applications.

Text Books:

1. Engineering Chemistry by Jain and Jain; Dhanpat Rai Publication & Co.
2. Engineering Chemistry by Shikha Agarwal; Cambridge University Press.
3. Physical chemistry by K.Bahl and Tuli
4. Elementary organic spectroscopy by Y.R. Sharma, S.Chand publications

5. Spectroscopic techniques by H.Kaur. Pragati Prakashan publications

Reference Books:

1. Engineering Chemistry of Wiley India Pvt. Ltd., Vairam and others.
2. Engineering Chemistry by Prasanth Rath, Cengage Learning.
3. A text book of engineering Chemistry by S. S. Dara; S. Chand & Co Ltd., Latest Edition
4. Applied Chemistry by H.D. Gesser, Springer Publishers
5. Text book of Nano-science and nanotechnology by B.S. Murthy, P. Shankar and others.

Web References:

1. http://jntuk-coeerd.in/
2. http://en.wikipedia.org/wiki/title
3. http://nptel.ac.in/coures/105106/.com
4. https://en.wikipedia.org/wiki/Electrochemistry
5. https://www.youtube.com/watch?v=WLyaZbT97EI&list=PLzW3l18TEXrpqo3jRarGr9ao-61tB2184
6. http://encyclopedia.che.engin.umich.edu/Pages/Polymers/PolymerProduction/PolymerProduction.html
7. http://encyclopedia.che.engin.umich.edu/Pages/ProcessParameters/Spectrometers/Spectrometers.html

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B.Tech. I Year II Semester **Course Structure**

L	T	P	C
3	0	0	3

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to ECE,CSE,IT,EEE)

Internal Marks: 40

Course Code: P18EST01 **External Marks: 60**

Course Prerequisite: Physics.

Course Objective:

1. To study the concept of passive elements, and understand the applications of network theorems for analysis of electrical networks.
2. To Analyze the single-phase ac circuits consisting of R,L, C, RL, RC, RLC combinations.
3. To understand the faraday's laws and basic Principle of transformer.
4. To understand the working principle of various rotating machines.
5. To study the operation of PN junction diode, half wave, full wave rectifiers, Transistors and OP-AMPs.

Course Outcomes:

After completion of this course, the student is able to:

1. Solve various electrical networks in presence of active and passive elements and by using principles of network theorem.
2. Analyze the single-phase ac circuits consisting of R,L, C, RL, RC, RLC combinations.
3. Understand the faraday's laws and basic Principle of transformer.
4. Understand the working principle of various rotating machines.
5. Study the operation of PN junction diode, half wave, full wave rectifiers, Transistors and OP-AMPs

UNIT – I (10 Lectures)

Electrical Circuits

Basic definitions – Types of network elements- Types of sources - Ohm's Law - Kirchhoff's Laws –Inductive networks - Capacitive networks – Series - Parallel circuits- Star-delta and delta-star transformations - Source transformation - nodal analysis and mesh analysis - Super position theorem.

UNIT – II (9 Lectures)

AC Circuit Analysis

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R,L, C, RL, RC, RLC combinations. Three phase balanced circuits, voltage and current relations in star and delta connections.

UNIT –III (9 Lectures)

Magnetic Circuits and Transformers

Basic definition of Magnetic quantities - Faraday's laws of electromagnetic induction- Analogy between electrical and magnetic circuits. Concept of self and mutual inductance. Principle of operation and construction of single phase transformer–EMF equation – Applications.

UNIT- IV (11 Lectures)

Rotating Machines

Construction and Principle of operation of DC Machines - EMF equation – Torque equation –Speed control of DC Shunt Motor- power losses and efficiency - Principle of operation and construction of 3-phase Induction motor - Principle of operation and construction of alternators.

UNIT – V (9 Lectures)

Introduction to Semiconductor Devices

PN junction diode - Diode applications -Half wave -Full wave rectifiers – Types of Transistors - PNP and NPN junction transistors, transistor as an amplifier- Frequency response of CE Amplifier- Characteristics of Operational Amplifiers.

Textbooks:

1. Engineering Circuit Analysis by William Hayt and Jack E.Kemmerley, McGraw Hill Company,6 th Edition
2. Electrical Technology by Surinder Pal Bali, Pearson Publications.
3. Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky, 9th Edition, PEI/PHI 2006.
4. Electronic Devices and Circuits – J. Millman, C.C. Halkias, Tata Mc-Graw Hill

Reference Books:

1. Electrical Circuit Theory and Technology by John Bird, Routledge Taylor &Francis Group
2. Electrical Machines by D. P.Kothari, I .J .Nagarth, Mc Graw Hill Publications, 4th Edition
3. Electrical Machines by R.K.Rajput, Lakshmi publications, 5th Edition.
4. Basic Electrical Engineering by M.S.Naidu and S.Kamakshiah, TMH Publications
5. Electronic Devices and Circuits by David A. Bell, Oxford University Press
6. Electronic Devices and Circuits – Salivahanan, Kumar, Vallavaraj, TATA MC Graw Hill, Second Edition

Web References:

1. https://embeddedengineers.files.wordpress.com/2015/09/electronic-devices-and-circuits-by-salivahanan.pdf
2. https://electricalanswers.files.wordpress.com/2014/09/a-textbook-of-electrical-technology-volume-i-basic-electrical-engineering-b-l-theraja.pdf

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I Year - II Semester

Course Structure

L	T	P	C
0	0	3	1.5

PYTHON PROGRAMMING LAB

(Common to EEE,ME,ECE,CSE,IT,AME Branches)

Course Code: P18ESL04

Internal Marks: 40
External Marks: 60

Course Outcomes:

1. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python.
2. Express different Decision Making statements and Functions.
3. Interpret Object oriented programming in Python.
4. Understand File handling operations.
5. Design GUI Applications.

Exercise1 - Basics

a) Running instructions in Interactive interpreter and a Python Script
b) Write a program to purpose fully raise Indentation Error and Correct it

Exercise 2 - Operations

a) Write a program to compute distance between two points taking input from the user (Pythagorean Theorem).
b) Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

Exercise 3 – Control Flow

a) Write a Program for checking whether the given number is a even number or not.
b) Using a for loop, write a program that prints out the decimal equivalents of 1/2,1/3,1/4,...,1/10.
c) Write a program using a for loop that loops over a sequence. What is sequence?
d) Write a program using a while loop that asks the user for a number, and prints a count down from that number to zero.

Exercise 4 – Control Flow-Continued

a) Find the sum of all the primes below two million. Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be:

   1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...

b) By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

Exercise 5 - DS

a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure.
b) Write a program to use split and join methods in the string and trace a birth day with a dictionary data structure.

Exercise 6- DS-Continued

a) Write a program combine_lists that combines these lists into a dictionary.
b) Write a program to count frequency of characters in a given file. Can you use characterfrequency to tell whether the given file is a Python program file, C program file or a text file?

Exercise 7 - Files

a) Write a program to print each line of a file in reverse order.
b) Write a program to compute the number of characters, words and lines in a file.

Exercise 8 - Functions

a) Write a function dups to find all duplicates in the list.
b) Write a function unique to find all the unique elements of a list.

Exercise 9 - Functions –Problem Solving

a) Write a function cumulative_product to compute cumulative product of a list of numbers.
b) Write a function reverse to reverse a list. Without using the reverse function.
c) Write function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

Exercise 10 – Multi - D Lists

a) Write a program to perform addition of two square matrices.
b) Write a program to perform multiplication of two square matrices.

Exercise 11 - OOP

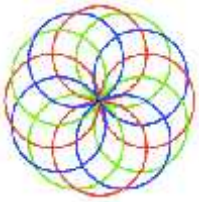
Class variables and instance variable and illustration of the self variable

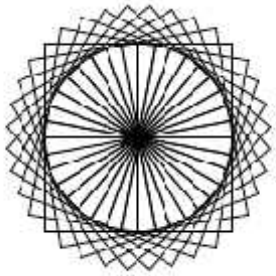
i)Robot.

ii)ATM Machine.

Exercise - 12 GUI, Graphics

a) Write a GUI for an Expression Calculator using tk.
b) Write a program to implement the following figures using turtle





B.Tech I Year II Semester

Course Structure

L	T	P	C
0	0	3	1.5

APPLIED/ENGINEERING CHEMISTRY LAB

(Common to ECE,CSE,IT)

Internal Marks: 40

Course Code: P18BSL03 **External Marks: 60**

Course Prerequisite: Basic Chemistry at Intermediate or equivalent level.

Course Objectives:

The purpose of this course to provide students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence.

Course Outcomes:

After completion of this course, the students should be able to

1. Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results.
2. Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results.

List Of Experiments:

Introduction to chemistry laboratory – Molarity, Normality, Primary, Secondary standard solutions, Volumetric titrations, Quantitative analysis, Qualitative analysis etc.

Volumetric Analysis:

1. Estimation of Na_2CO_3 using standard HCl solution
2. Estimation of Mohr's salt using potassium dichromate ($K_2Cr_2O_7$) solution
3. Estimation of $CuSO_4$ using sodium thio sulphate ($Na_2S_2O_3$) solution.

Water Analysis:

4. Determination of hardness of water sample by EDTA method
5. Determination of alkalinity of water sample
6. Determination of free chlorine in bleaching powder

Instrumental Titrations:

7. Conduct metric Titrations between strong acid and strong base.
8. Conduct metric Titrations between strong acid and weak base.
9. Potentio metric Titration between Ferrous iron and potassium dichromate ($K_2Cr_2O_7$) solution

Food Analysis & Separation Of Compounds:

10. Estimation of Vitamin-c
11. Thin layer chromatography

Preparation Of Polymeric Resin:

12. Preparation of phenol formaldehyde resin
13. Preparation of urea formaldehyde resin

Lab Manual: Engineering/Applied Chemistry Lab Manual, Dept. of Chemistry, Pace Institute of Technology and Science, Vallur, Prakasam Dist., Andhra Pradesh, India.

Reference Books:

1. Dr. Jyotsna Cherukuris (2012) Laboratory Manual of engineering chemistry-II,
2. VGS Techno Series 3. Chemistry Practical Manual, Lorven Publications

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B.Tech. I Year II Semester

Course Structure

L	T	P	C
0	0	3	1.5

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

(Common to ECE,CSE,EEE.IT)

Internal Marks: 40

Course Code: P18ESL01 **External Marks: 60**

Course Prerequisite: None

Course Objective:

1. To verify and demonstrate on safety precautions and Kirchhoff's laws.
2. To demonstrate various protective devices, construction of transformer and rotating machines.
3. To verify superposition theorem and control of dc shunt motor using speed control methods.
4. To analyze the characteristics of CE amplifier, Half & Full wave rectifiers.
5. To analyze the characteristics of OP –Amp and CE amplifier

Course Outcomes:

After completion of this course, the student is able to:

1. Get an exposure on safety precautions and verify Kirchhoff 'slaws.
2. Get an exposure on construction of transformer and various protective devices.
3. Verify superposition theorem and control the speed of DC shunt motor using speed control methods.
4. Analyze the characteristics of CE amplifier, Half & Full wave rectifiers.
5. Analyze the characteristics of OP –Amp and CE amplifier

The following experiments are required to be conducted as compulsory experiments:

1. Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real-life resistors, capacitors and inductors.
2. Verification of Kirchhoff's laws.
3. Demonstration of construction of Transformer and Rotating machines.
4. Demonstration on various protective devices.
5. Verification of superposition theorem
6. Speed control of D.C. Shunt motor by
    1. Armature Voltage control b) Field flux control method

7. PN junction diode characteristics
    a. Forward bias
    b. Reverse bias (Cut in voltage and resistance calculations)
8. Transistor CE characteristics (Input and output)
9. CE Amplifier Characteristics
10. Half Wave rectifier and Full Wave Rectifier without filters

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B.Tech II Year I Semester

Course Structure

L	T	P	C
3	0	0	3

JAVA PROGRAMMING

(CSE)

Internal Marks : 40

Course Code: P18CST01 **External Marks: 60**

Course Prerequisite: C Programming

Course Objectives:

1. To understand Object Oriented Programming concepts and basic characteristics of Java
2. To understand the principles of packages, inheritance and interfaces
3. To Implement exceptions and use I/O streams
4. To design and build simple Graphical User Interface application.

Course Outcomes:

1. Implement OOPS concepts in Java programs
2. Develop Java programs with the concepts of inheritance and interfaces
3. Design a Java applications using exceptions and I/O streams
4. Design interactive Java application using swings

UNIT-I: (9 Lectures)

OOPS-Fundamentals: Object Oriented Programming concepts - Abstraction - objects and classes - Encapsulation- Inheritance -Polymorphism- OOP in Java - Characteristics of Java- Java Source File -Structure- Compilation- Data Types - Variables and Arrays - Operators - Control Statements- Classes – Objects - Methods.

UNIT-II: (9 Lectures)

OOPS-Inheritance: Inheritance - constructors- polymorphism-Access specifier-Static members-Packages -Abstract classes- Interfaces and Inner classes-object cloning -Array Lists - Strings.

UNIT-III: (9 Lectures)

Exception Handling: Exception handling -try-catch, throw, throws, finally block, user defined exception-built-in exceptions- Stack Trace Elements-Input -Output Basics - Streams - Byte streams and Character streams - Reading and Writing Console - Reading and Writing Files.

UNIT-IV: (9 Lectures)

Concurrent Programming: Multi-threaded programming - thread life cycle- interrupting threads - thread states - thread priorities- thread synchronization- Inter-thread communication,

daemon threads, thread groups-java Applets- Applet class, Applet structure, An Example Applet Program, Applet Life Cycle.

UNIT-V: (9 Lectures)

Graphics Programming: Graphics programming - Frame - Components- java.awt package, Container class, Layouts, Basics of event handling - event handlers -AWT event hierarchy - Swing Components- Text Fields, Text Areas - Buttons- Check Boxes – Radio Buttons - Lists- choices- Scrollbars - Windows -Menus - Dialog Boxes.

Text Books:

1. Java The complete reference, Herbert Schildt , 8th Edition, McGraw Hill Education, 2011.
2. Core Java Volume –I Fundamentals, Cay S. Horstmann, Gary cornell, 9th Edition, Prentice Hall, 2013.
3. Programming with JAVA, E.Balaguruswamy, 5th Edition, McGraw Hill Education, 2014.

References:

1. Java 2 Black book, Steven Holzner, Dreamtech press, 2011.
2. The JAVA programming language, K. Arnold and J. Gosling, Third edition, Pearson Education, 2000.
3. An introduction to Object-oriented programming with Java, C. Thomas Wu, Fourth Edition, Tata McGraw-Hill Publishing company Ltd., 2006.

Web References:

1. www.javaworld.com
2. www.ibm.com
3. www.java.sun.com

B.Tech II Year I Semester

Course Structure

L	T	P	C
3	1	0	4

DATA STRUCTURES
(CSE)

Internal Marks: 40

Course Code: P18CST02 **External Marks: 60**

Course Prerequisite: C Programming

Course Objectives:

1. Comprehensive knowledge of data structures and ability to implement the same in software applications.
2. Exposure to algorithmic complexities, recursive algorithms, searching techniques.
3. Exposure to sorting technique, Applying stack techniques for logical operations.
4. Applying queue techniques for logical operations, Exposure to list representation models in various types of applications.
5. Implementation of tree in various forms, Advanced understanding of other variants of trees and their operations.
6. Orientation on graphs, representation of graphs, graph traversals, spanning trees Graphs.

Course Outcomes:

1. Student will be able to choose appropriate data structure as applied to specified problem definition.
2. Implement appropriate sorting/searching technique for given problem
3. Implement operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures.
4. Students will be able to implement Linear and Non-Linear data structures

UNIT-I: (12 Lectures)

Data Structure, Recursion & **Searching:** Preliminaries of algorithm, Algorithm analysis and complexity. **Data Structure:** Definition, types of data structures.

Recursion: Definition, Design Methodology and Implementation of recursive algorithms, Types of recursion (Linear, binary and Tail), recursive algorithms for factorial function, GCD Computation, Fibonacci sequence.

Searching: List Searches using Linear Search, Binary Search, Fibonacci Search

UNIT-II: (12 Lectures)

Sorting Techniques: Basic Concepts, Sorting by: Insertion (Insertion Sort), Selection (heap sort), Exchange(Bubble sort, Quick Sort), distribution(Radix sort) and merging(Merge sort) Algorithms.

Stacks: Basic Stack operations, Representation of a stack using arrays, Stack Applications: Reversing list, Infix to postfix transformation.

UNIT-III: (13 Lectures)

Queues: Introduction, Representation of a Queue using arrays, Queue Operations, Applications of queues- Round Robin Algorithm, Circular Queues, Priority Queues.

Linked List: Introduction, single linked list, representation of a linked list in memory, Operations on a single linked list, Reversing a single linked list, applications: single linked list to represent polynomial expressions, Circular linked list, Double linked list.

UNIT-IV: (12 Lectures)

Trees: Basic tree concepts, Binary Trees: Properties, Representation of Binary Trees using arrays, operations on a Binary tree, Binary Tree Traversals (recursive).

Advanced Tree Concepts: Binary search tree, Basic concepts, BST operations: Searching, insertion, deletion, Balanced search trees-AVL Trees-Definition and Examples only, B-Trees Definition and Examples only.

UNIT-V: (11 Lectures)

Graphs: Basic concepts, Graph Representations- Adjacency matrix, Adjacency lists, Graph algorithms: Graph Traversals (BFS & DFS), applications: Dijkstra's shortest path, Minimum Spanning Tree using Prim's & Kruskal's Algorithm.

Text Books:

1. Data Structures, 2/e, Richard F, Gilberg , Forouzan, Cengage,2007.
2. Data Structures and Algorithms, G.A.V.Pai, TMH, 2008
3. Data Structures and Algorithms Made Easy, Narasimha Karumanchi , Second Edition, 2011.

Reference Books:

1. Data Structure with C, Seymour Lipschutz, TMH,2010.
2. Classic Data Structures, 2/e, Debasis ,Samanta,PHI,2009
3. Fundamentals of Data Structure in C, 2/e, Horowitz, Sahni, Anderson Freed, University Press.

Web References:

1. www.geeksforgeeks.org
2. www.hackr.io.
3. www.letsfindcourse.com

B.Tech II Year I Semester

Course Structure

L	T	P	C
3	0	0	3

DIGITAL LOGIC DESIGN

(CSE)

Internal Marks : 40

Course Code: P18EST20 **External Marks: 60**

Course Prerequisite: NIL

Course Objectives:

1. Able to perform the conversion among different number systems.
2. Familiar with basic logic gates -- AND, OR & NOT, XOR, XNOR; independently or work in team to build simple logic circuits using basic.
3. Understand Boolean algebra and basic properties of Boolean algebra; able to simplify simple Boolean functions by using the basic Boolean properties.
4. Able to design simple combinational logics using basic gates. Able to optimize simple logic using Karnaugh maps, understand "don't care".
5. Familiar with basic sequential logic components: SR Latch, D Flip-Flop and their usage and able to analyze sequential logic circuits.

Course Outcomes:

1. Students will be aware of various number systems and conversion of number systems.
2. Students will be aware of theory of Boolean Algebra & the underlying features of various logic gates.
3. Students will be aware of designing mapping method upto 6-variables.
4. Students will be able to use the concepts of Boolean Algebra for the analysis & design of various combination logic circuits.
5. Students will be able to use the concepts of Boolean Algebra for the analysis & design of various sequential logic circuits.

UNIT- I: (9 Lectures)

Number Systems and Binary Codes: Number System, Types of Number Systems, Number base Conversions from one radix to another radix, Representation of Signed Binary Numbers, 2's complement arithmetic, 1's complement arithmetic. Gray code, Excess-3 code, BCD code. Binary Arithmetic.

UNIT -II: (9 Lectures)

Boolean algebra: Logic gates, Laws of Boolean algebra, Principle of Duality, Principle of Complements, Reducing Boolean Expressions, Boolean Functions, Canonical and Standard Forms, M-Notations: Minterms and Maxterms,

UNIT- III: (10 Lectures)

Gate level Minimization: Map Method, Two-Variable K-Map, Three-Variable K-Map, Four Variable K-Maps. Products of Sum Simplification, Sum of Products Simplification, Don't – Care Conditions, Implementation using NAND and NOR.

UNIT- IV: (9 Lectures)

Combinational Logic Design: Introduction, Design Procedure, Adders, Subtractors, Binary Adder–Subtractor, Decoders, Encoders, Multiplexers.

UNIT- V: (8 Lectures)

Sequential Logic Design: Introduction, Storage Elements: one bit memory cell, Latches, Flip Flops, Clocked Flip Flops, Shift Registers, Asynchronous counters, Synchronous counters.

Text Books:

1. Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA, 2011.
2. Fundamentals of Logic Design, 5/e, Roth, Cengage, 2010.
3. A.K.Singh,Digital Logic Circuits, New Age International Publishers,

Reference Books:

1. Switching Theory and Logic Design, A.Anand Kumar, 2016.
2. Digital Electronics and Logic Design, Dr. Sanjay Sharma, 2010.
3. Modern Digital Electronics, R.P. Jain, TMH, 2010.

Web References:

1. www.researchgate.net
2. www.digital-logic-design.en.softonic.com
3. www.accessengineeringlibrary.com

B.Tech II Year I Semester

Course Structure

L	T	P	C
3	0	0	3

MATHEMATICS-III
(CSE)

Internal Marks : 40

Course Code: P18BST07 **External Marks: 60**

Course Prerequisite: Mathematics-I, Mathematics-II (P18BST01)

Course Objectives:

1. The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2. The Fourier series of a periodic function and its application to the solution of partial differential equations.
3. To calculate the Fourier transform or inverse transform of common functions including Delta, Unit-Step.
4. Learn to find Solution of One dimensional Wave, Heat equation.

Course Outcomes:

1. Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.
2. Solve ordinary differential equations numerically using Euler's and RK method.
3. Analyze the spectral characteristics of signals using Fourier analysis. Classify systems based on their properties and determine the response
4. Find Fourier series and Fourier transforms for certain functions.
5. Identify/classify and solve the different types of partial differential equations.

UNIT-I: (9 Lectures)

Solution of Algebraic and Transcendental Equations and Interpolation: Introduction- Bisection method – Method of false position – Newton- Raphson method. Interpolation: Introduction- Forward differences- Backward differences. Newton's formula for interpolation- Lagrange's interpolation formula.

UNIT-II: (9 Lectures)

Numerical Integration and solution of Ordinary Differential equations: Trapezoidal rule- Simpson's 1/3rd and 3/8th rule. Solution of ordinary differential equations by Taylor's series- Euler's method –Modified Euler's method, Runge- Kutta method of fourth order.

UNIT-III: (9 Lectures)

Fourier Series: Introduction- Determination of Fourier coefficients – even and odd functions –change of interval– Half-range sine and cosine series.

UNIT-IV: (9 Lectures)

Fourier Transforms: Fourier integral theorem (only statement) – Fourier sine and cosine integrals - sine and cosine transforms – properties – inverse transforms – Finite Fourier Transforms.

UNIT-V: (9 Lectures)

First order Partial differential equations: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions –solutions of first order linear (Lagrange) equation and nonlinear (standard types)equations. Method of separation of Variables- Solution of One dimensional Wave, Heat equation.

Text Books:

1. Higher Engineering Mathematics, B.S.Grewal, 43rd Edition, Khanna Publishers,2015.
2. Engineering Mathematics, N.P.Bali, Lakshmi Publications, 2011.
3. Advanced Engineering Mathematics, H.K.Dass, S.CHAND, 2007.

Reference Books:

1. Engineering Mathematics, Srimanta Pal, Subodh C.Bhunia, Oxford University Press, 2015
2. Advanced Engineering Mathematics, Erwin Kreyszig, 10th Edition, Wiley-India, 2011.
3. Higher Engineering Mathematics, Dass H.K., Rajnish Verma. Er., S. Chand Co.Pvt. Ltd, Delhi, 2011.
4. Advanced engineering mathematics with MATLAB, Dean G. Duffy, CRC Press,2003.
5. Advanced Engineering Mathematics, Peter O'neil, Cengage Learning.
6. Advanced Engineering Mathematics, Micheael Greenberg, 9th edition, Pearson edn, 2002.

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1. www.tutorial.math.lamar.edu
2. www.mathworld.wolfram.com
3. www.nptel.ac.in

B.Tech II Year I Semester

Course Structure

L	T	P	C
1	0	2	2

FREE OPEN SOURCE SOFTWARE
(CSE)

Internal Marks: 40

Course Code: P18CST03 **External Marks: 60**

Course Prerequisite: NIL

Course Objectives:
To teach students various unix utilities and shell scripting

1. **Session-1**
   1. Log into the system
   2. Use vi editor to create a file called myfile.txt which contains some text.
   3. Correct typing errors during creation.
   4. Save the file
   5. logout of the system

   Session-2
   1. Log into the system
   2. open the file created in session 1
   3. Add some text
   4. Change some text
   5. Delete some text
   6. Save the Changes
   7. Logout of the system
2. a) Log into the system
   b) Use the cat command to create a file containing the following data. Call it mytable use tabs to separate the fields

1425	Ravi	15.65
4320	Ramu	26.27
6830	Sita	36.15
1450	Raju	21.86

   c) Use the cat command to display the file, mytable.
   d) Use the vi command to correct any errors in the file, mytable.
   e) Use the sort command to sort the file mytable according to the first field. Call the sorted file my table (same name)
   f) Print the file mytable
   g) Use the cut and paste commands to swap fields 2 and 3 of mytable. Call it my table (same name)
   h) Print the new file, mytable
   i) Logout of the system
   j) Login to the system

k) Use the appropriate command to determine your login shell
l) Use the /etc/passwd file to verify the result of step b.
m) Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.
n) Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

3. Write a sed command that deletes the first character in each line in a file.
   a) Write a sed command that deletes the character before the last character in each line in a file.
   b) Write a sed command that swaps the first and second words in each line in a file.
4. Pipe your /etc/passwd file to awk, and print out the home directory of each user.
   a) Develop an interactive grep script that asks for a word and a file name and then tells how many lines contain that word.
   b) Repeat
   c) Part using awk
5. a) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.
   b) Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.
6. Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.
7. a) Write a shell script that computes the gross salary of a employee according to the following rules
   i)If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic.
   ii)If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic The basic salary is entered interactively through the key board.
8. Write a shell script to search given number using binary search.
9. a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
   b) Develop an interactive script that ask for a word and a file name and then tells how many times that word occurred in the file.
   c) Write a shell script to perform the following string operations:
      i) To extract a sub-string from a given string.
      ii) To find the length of a given string.
10. Write a shell script which will display Armstrong numbers from given arguments
11. Write a shell script to display factorial value from given argument list
12. Write a C program that simulates ls Command
    (Use system calls / directory API)

Do the following Shell programs also

1. Write a shell script to check whether a particular user has logged in or not. If he has logged in, also check whether he has eligibility to receive a message or not

2. Write a shell script which will display the username and terminal name who login recently in to the unix system
3. Write a shell script to find no. of files in a directory
4. Write a shell script to check whether a given number is perfect or not
5. Write a menu driven shell script to copy, edit, rename and delete a file
6. Write a shell script for concatenation of two strings
7. Write a shell script which will display Fibonacci series up to a given number of argument
8. Write a shell script to accept student number, name, marks in 5 subjects. Find total, average and grade. Display the result of student and store in a file called stu.dat
   Rules: avg>=80 then grade A
   Avg<80&&Avg>=70 then grade B
   Avg<70&&Avg>=60 then grade C
   Avg<60&&Avg>=50 then grade D
   Avg<50&&Avg>=40 then grade E
   Else grade F
9. Write a shell script to accept empno,empname,basic. Find DA,HRA,TA,PF using following rules. Display empno, empname, basic, DA,HRA,PF,TA,GROSS SAL and NETSAL. Also store all details in a file called emp.dat
   Rules: HRA is 18% of basic if basic > 5000 otherwise 550
   DA is 35% of basic
   PF is 13% of basic
   IT is 14% of basic
   TA is 10% of basic
10. Write a shell script to demonstrate break and continue statements
11. Write a shell script to display string palindrome from given arguments
12. Write a shell script to display reverse numbers from given argument list
13. Write a shell script which will find maximum file size in the given argument list
14. Write a shell script which will greet you “Good Morning”, ”Good Afternoon”, “Good Evening” and “Good Night” according to current time
15. Write a shell script to sort the elements in a array using bubble sort technique
16. Write a shell script to find largest element in a array
17. Write an awk program to print sum, avg of students marks list
18. Write an awk program to display students pass/fail report
19. Write an awk program to count the no. of vowels in a given file
20. Write an awk program which will find maximum word and its length in the given input File
21. Write a shell script to generate the mathematical tables.
22. Write a shell script to sort elements of given array by using selection sort.
23. Write a shell script to find number of vowels, consonants, numbers, white spaces and special characters in a given string.
24. Write a shell script to search given number using binary search.

B. Tech II Year I Semester

Course Structure			
L	**T**	**P**	**C**
0	**0**	**3**	**1.5**

JAVA PROGRAMMING LAB (CSE)

Internal Marks : 40

Course Code: P18CSL01 **External Marks: 60**

Course Prerequisites: C Programming and Object-Oriented Concepts.

Course Objectives:

1. To build software development skills using java programming for real-world applications.
2. To understand and apply the concepts of classes, packages, interfaces, arraylist, exception handling and file processing.
3. To develop applications using JDBC programming and event handling.

Course Outcomes:

1. Develop and implement Java programs for simple applications that make use of classes, packages and interfaces.
2. Develop and implement Java programs with arraylist, exception handling and multithreading .
3. Design applications using file processing, JDBC programming and event handling.

Exercise - 1 (Basics)

1. Write a JAVA program to display default value of all primitive data type of JAVA.
2. Write a java program that display the roots of a quadratic equation ax2+bx=0. Calculate the discriminate D and basing on value of D, describe the nature of root.
3. Write a program to check whether a number is Armstrong or not

Exercise - 2 (Operations, Expressions, Control-flow, Strings)

1. Write a JAVA program to search for an element in a given list of elements using binary search mechanism.
2. Write a JAVA program to sort for an element in a given list of elements using bubble sort.
3. Write a Java program to demonstrate String handling methods.

Exercise - 3 (Class, Objects, Constructor)

1. Write a JAVA program to implement class mechanism. – Create a class, methods and invoke them inside main method.
2. Write a JAVA program implement method overloading.
3. Write a JAVA program to implement constructor and constructor overloading.

Exercise - 4 (Inheritance, Method Overriding)

1. Write a JAVA program to implement Single Inheritance
2. Write a JAVA program to implement multi level Inheritance
3. Write a java program for abstract class to find areas of different shapes
4. Write a JAVA program that implements Runtime polymorphism(Method Overriding) problem

Exercise - 5 (Array List & Exception)

1. Write a program to perform string operations using ArrayList. Write functions for the following
   a. Append
   b. Insert
   c. Search
   d. List all string starts with given letter.
2. Write a JAVA program that describes exception handling mechanism
3. Write a JAVA program Illustrating Multiple catch clauses

Exercise – 6 (User defined Exception)

1. Write a JAVA program for creation of Illustrating throw.
2. Write a JAVA program for creation of Illustrating finally.
3. Write a JAVA program for creation of Java Built-in Exceptions.
4. Write a JAVA program for creation of User Defined Exception.

Exercise – 7 (Threads)

1. Write a JAVA program that creates threads by extending Thread class .First thread display “Good Morning “every 1 sec, the second thread displays “Hello “every 2 seconds and the third display “Welcome” every 3 seconds ,(Repeat the same by implementing Runnable).
2. Write a program illustrating **isAlive** and **join ().**

Exercise - 8 (File Handling)

Write a Java program that reads a file name from the user, displays information about whether the file exists, whether the file is readable, or writable, the type of file and the length of the file in bytes.

Exercise – 9 (JDBC & Packages)

1. Write a java program that connects to a database using JDBC of the following
   a. add
   b. Delete
   c. Modify
   d. Retrieve operations.
2. Write a java program to create a package called employee and implement this package out of the package.

Exercise - 10 (Applet)

1. Write a JAVA program to paint like paint brush in applet.
2. Write a JAVA program to display analog clock using Applet.
3. Write a JAVA program to create different shapes and fill colors using Applet.

Exercise - 11 (Event Handling)

1. Write a JAVA program that display the x and y position of the cursor movement using Mouse.
2. Write a JAVA program that identifies key-up key-down event user entering text in a Applet.

Exercise - 12 (Swings)

1. Write a JAVA program to build a Calculator in Swings.
2. Write a JAVA program to display the digital watch in swing tutorial.

Exercise – 13 (Swings - Continued)

1. Write a JAVA program that to create a single ball bouncing inside a JPanel.
2. Write a JAVA program JTree as displaying a real tree upside down

B.Tech II Year I Semester

Course Structure

L	T	P	C
0	0	3	1.5

DATA STRUCTURES LAB
(CSE)

Internal Marks : 40

Course Code: P18CSL02 **External Marks: 60**

Course Prerequisites: C- Programming

Course Objectives:
1. To choose the appropriate data structure and algorithm design method for a specified application.
2. To solve problems using data structures such as linear lists, stacks, queues, hash tables, binary trees, heaps binary search trees, and graphs and writing programs for these solutions.

Course Outcomes:
1. Analyze worst-case running times of algorithms using asymptotic analysis and implement various data structures like linked lists.
2. Understand and implement stacks and queues using arrays and linked lists.
3. Analyze and implement various searching and sorting algorithms.
4. Design and implement appropriate hash function and collision-resolution algorithms

Exercise 1:
Write recursive program for the following
a) Write recursive C program for calculation of Factorial of an integer
b) Write recursive C program for calculation of GCD (n, m)
c) Write recursive program which computes the n^{th} Fibonacci number

Exercise 2:
a) Write recursive C program for functions to perform Linear search for a Key value in a given list.
b) Write recursive C program for functions to perform Binary search for a Key value in a given list.
c) Write recursive C program for functions to perform Fibonacci search for a Key value in a given list.

Exercise 3:
a) Write C program that implement Bubble sort, to sort a given list of integers in ascending order.
b) Write C program that implement Quick sort, to sort a given list of integers in ascending order

c) Write C program that implement Insertion sort, to sort a given list of integers in ascending order

Exercise 4:

a) Write C program that implement heap sort, to sort a given list of integers in ascending order

b) Write C program that implement radix sort, to sort a given list of integers in ascending order

c) Write C program that implement merge sort, to sort a given list of integers in ascending order

Exercise 5:

a) Write C program that implement stack (its operations) using arrays

b) Write C program that implement stack (its operations) using Linked list

Exercise 6:

a) Write a C program that uses Stack operations to Convert infix expression into postfix expression

b) Write C program that implement Queue (its operations) using arrays.

c) Write C program that implement Queue (its operations) using linked lists

Exercise 7:

a) Write a C program that uses functions to create a singly linked list

b) Write a C program that uses functions to perform insertion operation on a singly linked list

c) Write a C program that uses functions to perform deletion operation on a singly linked list.

Exercise 8:

a) Write a C program to Create a Binary Tree of integers

b) Write a recursive C program for Traversing a binary tree in preorder, inorder and postorder.

Exercise 9:

Write a C program for BST operations (insertion, deletion)

Exercise 10:

a) Write a C program for finding minimum spanning tree in a graph by using Prim's algorithm.

b) Write a C program for finding minimum spanning tree in a graph by using Kruskal's algorithm.

B.Tech II Year I Semester

Course Structure

L	T	P	C
0	0	3	1.5

DIGITAL LOGIC DESIGN LAB

(CSE)

Internal Marks : 40

Course Code: P18ECL11 **External Marks: 60**

Course Prerequisites: NIL

Course Objectives:

1. Understand concept of various components
2. Understand concepts that underpin the disciplines of Analog and digital electronic logic circuits
3. Describe Various Number system and Boolean algebra
4. Design and implementation of combinational circuits
5. Design and implementation of sequential circuits
6. Describe Hardware description language

Course Outcomes:

1. Achieve Knowledge and Awareness of various components to design stable analog circuits.
2. Represent numbers and perform arithmetic operations.
3. Minimize the Boolean expression using Boolean algebra and design it using logic gates
4. Analyse and design combinational circuit.
5. Design and develop sequential circuits
6. Translate real world problems into digital logic formulations using VHDL.Laboratory Objectives and outcomes for Digital Design

Experiments:

1. Verification of Logic gates.
2. Implementation all individual gates with Universal gates NAND & NOR.
3. Design a circuit for the given canonical form, draw the circuit diagram & Verify the De-Morgan laws.
4. Construct Half adder & full adder using half adder and verify truth table.
5. Design and study the Half Subtractor and verify the truth table.
6. Design a combinational logic circuit for 4x1 MUX and verify the truth table.
7. Design a combinational logic circuit for 1x4 DE-MUX and verify the truth table.
8. Design and implementation of BCD to excess-3 code converter and vice versa using logic gates.
9. Design and implementation of binary to gray code converter and vice versa using logic gates

10. Verification of the truth table of basic flip-flops with synchronous & asynchronous modes.

B. Tech II Year I Semester

Course Structure

L	T	P	C
3	0	0	0

ENVIRONMENTAL SCIENCE
(CSE)

Internal Marks : 100

Course Code: P18MCT02

Course Prerequisite: Basic knowledge about sciences up to intermediate or equivalent level.

Course Objectives:

1. Overall understanding of the natural resources
2. Basic understanding of the ecosystem and its diversity
3. Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities
4. An understanding of the environmental impact of developmental activities
5. Awareness on the social issues, environmental legislation and global treaties.

Course Outcomes:

1. The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web
2. The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources
3. Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices
4. The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity
5. Social issues both rural and urban environment and the possible means to combat the challenges and environmental assessment stages involved in EIA and the environmental audit.

UNIT-I: (9 Lectures)

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES: Definition, Scope and Importance– Need for Public Awareness. Renewable energy Resources, Solar energy-solar cells, solar batteries, wind energy, wind mills, ocean energy, tidal energy and nonrenewable energy resources: LPG, water gas, producer gas. World food problems, degradation and Soil erosion - overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging and salinity.

UNIT-II: (9 Lectures)

ECOSYSTEMS: Concept of an ecosystem. – Structure, Components and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Ecological pyramids - Food chains, food webs and Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem d. Aquatic – River and Lake Ecosystems.

UNIT-III: (9 Lectures)

BIODIVERSITY AND ITS CONSERVATION: Introduction, Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India –Value of biodiversity: consumptive use, Productive use, social, ethical and aesthetic values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-IV: (9 Lectures)

ENVIRONMENTAL POLLUTION: Definition, Cause, Effects and Control measures of : a. Air Pollution, b. Water pollution, c. Soil pollution, d. Marine pollution, e. Noise pollution, f. Nuclear hazards.

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – **Disaster management:** floods, earthquake, cyclone and landslides.

UNIT-V: (9 Lectures)

SOCIAL ISSUES AND THE ENVIRONMENT: From unsustainable to sustainable development – Urban problems related to energy – Water conservation, rain water harvesting and watershed management –Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies Population growth – Impacts on society, variation among nations. Environmental Impact Assessment (EIA) and Environmental Protection Acts.

Text Books:

1. Text book of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission, Universities Press, 2005.
2. Environmental Studies by Benny Joseph, Tata McGraw Hill Co, New Delhi, 2008.

Reference Books:

1. Environmental Science & Engineering by Dr. A. Ravikrishnan, Hitech Publishing Company Pvt. Ltd. 2013.
2. Perspectives in Environmental Studies, Second edition, AnubhaKoushik and C.P. Koushik, New Age International (P) Limited, Publishers, 2004.

Web References:

1. www.oplin.ohio.gov
2. www.lib.montana.edu
3. www.msichicago.org

B.Tech II Year II Semester

Course Structure

L	T	P	C
3	0	0	3

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

(CSE)

Internal Marks : 40

Course Code: P18CST04 **External Marks: 60**

Prerequisites: Basic Mathematics.

Course Objectives:

1. To explain with examples the basic terminology of functions, relations, and sets.
2. To perform the operations associated with sets, functions, and relations.
3. To relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.
4. To describe the importance and limitations of predicate logic.
5. To relate the ideas of mathematical induction to recursion and recursively defined structures.
6. To use Graph Theory for solving problems.

Course Outcomes:

1. Ability to Illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations.
2. Ability to Demonstrate in practical applications the use of basic counting principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology.
3. Ability to represent and Apply Graph theory in solving computer science problems.

UNIT I: (9 Lectures)

Mathematical Logic : Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers. **Predicates**: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT II: (10 Lectures)

Relations: Basic Structures, Sets, Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties,

.

UNIT III: (9 Lectures)

Elementary Combinatorics: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application. Algebraic

structures: Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups' homomorphism, Isomorphism.

UNIT IV: (8 Lectures)

Discrete Probability and Advanced Counting Techniques: An Introduction to Discrete Probability, Probability Theory, Bayes' Theorem, Expected Value and Variance **Advanced Counting Techniques:** Recurrence Relations, Solving Linear Recurrence Relations, Divide-and-Conquer Algorithms and Recurrence Relations, Generating Functions, Inclusion-Exclusion, Applications of Inclusion-Exclusion.

UNIT V: (9 Lectures)

Graphs: Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Shortest-Path Problems, Planar Graphs, Graph Coloring.

Trees: Introduction to Trees, Applications of Trees, Tree Traversal, Spanning Trees, Minimum Spanning Trees.

Text Books:

1. Discrete Mathematics and its Applications with Combinatorics and Graph Theory- Kenneth H Rosen, 7th Edition, TMH, 2012.
2. Introduction to Discrete Mathematics,M.K.Sen, B.C Chakraborty, 2012
3. Elements of DISCRETE MATHEMATICS- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill, 2008.
4. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel,T.P. Baker, PHI, 2008.

References Books:

1. Discrete Mathematical Structures with Applications to Computer Science-J.P. Tremblay and R. Manohar, TMH, 1988.
2. Discrete Mathematics- Richard Johnsonbaugh, 7Th Edn., Pearson Education, 2009.
3. Discrete Mathematics with Graph Theory- Edgar G. Goodaire, Michael M. Parmenter, 2nd edition,2002.
4. Discrete and Combinatorial Mathematics - an applied introduction: Ralph.P. Grimald, 5th edition, Pearson Education, 2016.

Web References:

1. www.digitaldefynd.com
2. www.mathily.org

B.Tech II Year II Semester

Course Structure

L	T	P	C
3	0	0	3

COMPUTER ORGANIZATION

(CSE)

Internal Marks : 40

Course Code: P18CST05 **External Marks: 60**

Course Prerequisite: NIL

Course Objectives:

1. Understand the architecture of a modern computer with its various processing units and Performance measurement of the computer system.
2. To understand various data transfer techniques in digital computer.
3. To understand the memory management system of computer.

Course Outcomes:

1. Ability to understand basic structure of computer.
2. To perform computer arithmetic operations.
3. To understand control unit operations.
4. To design memory organization that uses banks for different word size operations.
5. Ability to understand the concept of cache mapping techniques.
6. Ability to understand the concept of I/O organization.

UNIT I: (9 Lectures)

Basic Structure of Computers: Organization and Architecture, Structure and Function, Computer Components, Computer Function, Bus Interconnection, Processor Organization, Register Organization.

Basic Computer Organization and Design: Instruction codes, Computer instructions, Memory reference instructions, Instruction Cycle.

Central Processing Unit: Stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, RISC.

UNIT II: (10 Lectures)

Register Transfer and Micro Operations: Register transfer language, Register transfer, Bus and Memory transfers, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic Logic Shift Unit.

Micro Programmed Control: Control Memory, Address Sequencing, Micro Program examples, Design of control unit, Hardwired control..

UNIT III: (9 Lectures)

Computer Arithmetic: Data representation- Fixed point representation, Floating point representation, Addition and Subtraction, Multiplication Algorithms, Division Algorithms,

Floating-point Representations, Floating-point Arithmetic Operations, Decimal Arithmetic Units, Decimal Arithmetic Operations.

UNIT IV: (8 Lectures)

Memory Organization: Memory system overview, Memory Hierarchy, Semi-conductor Main Memory, Cache Memory principle, Elements of cache design, Virtual Memory, Magnetic Disk, Optical Memory, Magnetic Tape, RAID.

Input- Output: External Devices, I/O modules, Interrupts, Programmed I/O, Interrupt-driven I/O, Direct Memory Access, I/O Channels and Processors, PCI**.** Asynchronous Data Transfer, Priority Interrupt, Serial Communication**.**

UNIT V: (9 Lectures)

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Multi Processors: Multiprocessors and Multi computers, Characteristics of Multi-processors, Multiple Processor Organizations, Symmetric Multi-Processors, Cache Coherence, Clusters, Non Uniform Memory Access (NUMA).

Text Books:

1. Computer Systems Architecture, M. Moris Mano, 3rd Edition, Pearson Education, 2007.
2. Computer Organization and Architecture, William Stallings, 8th Edition, Pearson Education, 2010.
3. Computer Architecture and Organization, John P. Hayes, 3rd Edition, McGraw Hill,2012.

References:

1. Computer Systems Organization and Architecture, John D. Carpinelli, 3rd Edition, Pearson Education, 2001.
2. Computer Organization, Carl Hamacher, Zvonks Vranesic, SafeaZak , 5th Edition, TMH, 2011.

Web References:

1. www.hackr.io
2. www.nptel.ac.in
3. www.coursera.org

B.Tech II Year II Semester

Course Structure

L	T	P	C
3	1	0	4

FORMAL LANGUAGES & AUTOMATA THEORY

(Common for CSE & IT)

Internal Marks : 40

Course Code: P18CST06 **External Marks: 60**

Course Prerequisite: NIL

Course Objectives:

1. Introduce the student to the concepts of Theory of computation in computer science
2. The students should acquire insights into the relationship among formal languages, formal Grammars and automat.

Course Outcomes:

1. Classify machines by their power to recognize languages,
2. Employ finite state machines to solve problems in computing,
3. Explain deterministic and non-deterministic machines,
4. Comprehend the hierarchy of problems arising in the computer science.

UNIT I: (13 Lectures)

Finite Automata: Why Study Automata Theory? The Central Concepts of Automata Theory, Automation, Finite Automation, Transition Systems, Acceptance of a String by a Finite Automation, DFA, Design of DFAs, NFA, Design of NFA, Equivalence of DFA and NFA, Conversion of NFA into DFA, Finite Automata with E-Transition, Minimization of Finite Automata, Mealy and Moore Machines, Applications and Limitation of Finite Automata.

UNIT II: (12 Lectures)

Regular Expressions: Regular Expressions, Regular Sets, Identity Rules, Equivalence of two Regular Expressions, Manipulations of Regular Expressions, Finite Automata, and Regular Expressions, Inter Conversion, Equivalence between Finite Automata and Regular Expressions, Pumping Lemma, Closers Properties, Applications of Regular Expressions, Finite Automata and Regular Grammars, Regular Expressions and Regular Grammars.

UNIT III: (12 Lectures)

Context Free Grammars &Pushdown Automata: Formal Languages, Grammars, Classification of Grammars, Chomsky Hierarchy Theorem, Context Free Grammar, Leftmost and Rightmost Derivations, Parse Trees, Ambiguous Grammars, Simplification of Context Free Grammars-Elimination of Useless Symbols, EProductions and Unit Productions, Normal Forms for Context Free Grammars-Chomsky Normal Form and Greibach Normal Form, Pumping Lemma, Closure Properties, Applications of Context Free Grammars.

Pushdown Automata, Definition, Model, Graphical Notation, Instantaneous Description Language Acceptance of pushdown Automata, Design of Pushdown Automata, Deterministic and Non – Deterministic Pushdown Automata, Equivalence of Pushdown Automata and Context Free Grammars Conversion, Two Stack Pushdown Automata, Application of Pushdown Automata.

UNIT IV: (12 Lectures)

Turning Machine: Turing Machine, Definition, Model, Representation of Turing Machines-Instantaneous Descriptions, Transition Tables and Transition Diagrams, Language of a Turing Machine, Design of Turing Machines, Techniques for Turing Machine Construction, Types of Turing Machines, Church's Thesis, Universal Turing Machine, Restricted Turing Machine.

UNIT V: (11 Lectures)

Computability: Decidable and Un-decidable Problems, Halting Problem of Turing Machines, Post's Correspondence Problem, Modified Post's Correspondence Problem, Classes of P and NP, NP Hard and NP-Complete Problems.

Text Books:

1. Introduction to Automata Theory, Languages and Computation, J.E.Hopcroft, R.Motwani and J.D.Ullman, 3rd Edition, Pearson, 2008.
2. Theory of Computer Science-Automata, Languages and Computation, K.L.P.Mishra and N.Chandrasekharan, 3rd Edition, PHI, 2007.
3. Formal Languages and Automata Theory, Basavaraj S.Anami, Karibasappa K.G.,Wiley India,2011.

Reference Books:

1. Formal Language and Automata Theory, K.V.N.Sunitha and N.Kalyani, Pearson, 2015.
2. Introduction to Automata Theory, Formal Languages and Computation, Shyamalendu Kandar, Pearson, 2013.
3. Theory of Computation, V.Kulkarni, Oxford University Press, 2013.

Web References:

1. www.cs.cornell.edu
2. www.automatatutor.com
3. www.amazon.in

B.Tech. II Year II Semester

Course Structure

L	T	P	C
3	1	0	4

DATABASE MANAGEMENT SYSTEMS

(Common to CSE&IT)

Internal Marks : 40

Course Code: P18CST07 **External Marks: 60**

Course Prerequisite: NIL

Course Objectives:

1. Provides students with theoretical knowledge
2. Practical skills in the design, use of databases and database management systems in information technology applications.

Course Outcomes:

1. Acquire knowledge in fundamentals of DBMS and identify the differences between traditional file system and DB systems.
2. Understand various DBMS models and how queries are being processed and executed in RDBMS.
3. Analyze DB design methodology and normalization process.
4. Discuss the various transaction and concurrency management techniques
5. Discuss various files indexing techniques.

UNIT I: (11 Lectures)

INTRODUCTION: Database system, Characteristics (Database Vs File System), Database Users (Actors on Scene, Workers behind the scene), Advantages of Data base systems, Database applications. Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure

UNIT II: (13 Lectures)

ENTITY RELATIONSHIP MODEL: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.

RELATIONAL MODEL: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints and their importance.

BASIC SQL : Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update), basic SQL querying (select and project) using where clause, arithmetic & logical operations, Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, views.

UNIT III: (12 Lectures)

SCHEMA REFINEMENT (NORMALIZATION): Problems Caused by Redundancy, Decompositions, Problems Related to Decomposition, Functional dependency, Properties of Functional dependency, Properties of Decompositions - Lossless join decomposition and dependency preserving decomposition, Normal forms based on functional dependency - 1NF, 2NF and 3NF, concept of surrogate key, Boyce-Codd normal form(BCNF).

UNIT IV: (13 Lectures)

TRANSACTION MANAGEMENT AND CONCURRENCY CONTROL: Transaction, properties of transactions, transaction log, and transaction management with SQL using commit rollback and savepoint. Concurrency control for lost updates, uncommitted data, inconsistent retrievals and the Scheduler. Concurrency control with locking methods : lock granularity, lock types, two phase locking for ensuring serializability, deadlocks, Concurrency control with time stamp ordering : Wait/Die and Wound/Wait Schemes, Database Recovery management : Transaction recovery.

UNIT V: (11 Lectures)

OVERVIEW OF STORAGES AND INDEXING: Data on External Storage- File Organization and Indexing – Clustered Indexing – Primary and Secondary Indexes, Index Data Structures, Hash-Based Indexing – Tree-Based Indexing.

Text Books:

1. Database Management Systems, 3/e Raghuram Krishnan, Johannes Gehrke, TMH,2002.
2. Database Management System, 6/e Ramez Elmasri, Shamkant B. Navathe, PEA,2010.
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning,2012.
4. Database Management Systems,Rajesh Narang,Second Edition,2018.

References:

1. Database System Concepts. 5/e Silberschatz, Korth, TMH,2002.
2. Introduction to Database Systems, 8/e C J Date, PEA,2000.
3. The Database book principles & practice using Oracle/MySql Narain Gehani, University Press,2008.

Web References:

1. www.academy.vertabelo.com
2. www.w3schools.com
3. www.codecademy.com

B.Tech II Year II Semester

Course Structure			
L	**T**	**P**	**C**
3	**0**	**0**	**3**

SOFTWARE ENGINEERING

(CSE)

Internal Marks : 40

Course Code: P18CST08 **External Marks: 60**

Course Prerequisite: NIL

Course Objectives:

1. To understand the software life cycle models.
2. To understand the software requirements and SRS document.
3. To understand the importance of modeling and modeling languages.
4. To design and develop correct and robust software products.
5. To understand the quality control and how to ensure good quality software.
6. To understand the planning and estimation of software projects.
7. To understand the implementation issues, validation and verification procedures.
8. To understand the maintenance of software

Course Outcomes:

1. Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
2. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
3. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
4. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.

UNIT I: (9 Lectures)

Software and Software Engineering: The Nature of Software, The Unique Nature of WebApps, Software Engineering, Software Process, Software Engineering Practice, Software Myths.

Process Models: A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models, Process Terminology, Product and Process.

UNIT II: (9 Lectures)

Requirements Analysis And Specification: Requirements Gathering and Analysis, Software Requirement Specification (SRS), Formal System Specification.

Software Design: Overview of the Design Process, How to Characterise of a Design?, Cohesion and Coupling, Layered Arrangement of Modules, Approaches to Software Design

UNIT III: (9 Lectures)

Function-Oriented Software Design: Overview of SA/SD Methodology, Structured Analysis, Developing the DFD Model of a System, Structured Design, Detailed Design, Design Review, over view of Object Oriented design.

User Interface Design: Characteristics of Good User Interface, Basic Concepts, Types of User Interfaces, Fundamentals of Component-based GUI Development, A User Interface Design Methodology.

UNIT IV: (9 Lectures)

Coding And Testing: Coding, Code Review, Software Documentation, Testing, Unit Testing, Black-Box Testing, White-Box Testing, Debugging, Program Analysis Tool, Integration Testing, Testing Object-Oriented Programs, System Testing, Some General Issues Associated with Testing

UNIT V: (9 Lectures)

Software Reliability And Quality Management: Software Reliability, Statistical Testing, Software Quality, Software Quality Management System, ISO 9000, SEI Capability Maturity Model.

Software Maintenance: Software maintenance, Maintenance Process Models, Maintenance Cost, Software Configuration Management.

Text Books:

1. Software engineering A practitioner's Approach, Roger S. Pressman, Seventh Edition McGrawHill International Edition.
2. Fundamentals of Software Engineering, Rajib Mall, Third Edition, PHI.
3. Software Engineering, Ian Sommerville, Ninth edition, Pearson education

Reference Books:

1. Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
2. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
3. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
4. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.

Web References:

1. https://www.tutorialspoint.com/software_engineering
2. https://nptel.ac.in/courses/106101061/1
3. http://ceit.aut.ac.ir/~91131079/SE2/SE2%20Website/Lecture%20Slides.html

B.Tech II Year II Semester

Course Structure

L	T	P	C
1	0	2	2

LINUX PROGRAMMING

(CSE)

Internal Marks : 40

Course Code: P18CST09 **External Marks: 60**

Course Prerequisite: NIL

Course Objectives:

1. To give a practical orientation of programming in Linux environment using system calls and advanced concepts in Unix programming.

Course Outcomes:

1. Students will be able to understand the basic commands of linux operating system and can write shell scripts.
2. Students will be able to create file systems and directories and operate them.
3. Students will be able to create processes background and fore ground etc..by fork() system calls.
4. Students will be create shared memory segments, pipes, message queues and can exercise interprocess communication.

Programs List:

1. Write C programs that uses open, read, write system calls.
2. Write C programs that differentiates FILE *(file stream pointers in C standard library) and file descriptors by using functions such as fdopen, fileno.
3. Write a C program which lists all the files of current working directory whose size is more than given number of data blocks.
4. Write a C program which lists all the files of current working directory which contains hard link files.
5. Example C program which supports that child process inherits environment variables, command line arguments, opened' files.
6. Simple C program that demonstrates the failure of fork system call because of crossing system limits.
7. Simple C programs to demonstrate the use of pipe system call for inter process communication and also emulating piping in shell.
8. Simple C program to use named pipes for inter process communication.
9. Write a C program which emulates simple shell.
10. Write C program to create a thread using pthreads library and let it run its function.
11. Write a C program to illustrate concurrent execution of threads using pthreads library.
12. Write a C program to simulate ptrhead_create function failure by repeatedly calling the same.

13. Write a C program which creates a thread using pthread and passes arguments to the thread function.
14. Write C programs which uses sigset, sifillset, sigprocmask, related system calls and structures.
15. Write a C program to simulate memory segment violation run time error and implement a signal handler (both reliable and unreliable) which handles situation.
16. Write a C program to illustrate the use of sbrk system call.
17. Write a C program to illustrate inter process communication via message queues.
18. Write a C program to illustrate inter process communication via shared memory.
19. Write a C program to simulate producer and consumer problem using semaphores, shared memory, and fork.
20. Write a C program to simulate producer and consumer problem using semaphores, shared memory, and pthread_create.
21. Write a C program to simulate producer and consumer problem using muexes, shared memory, and threads.
22. Write socket Programs in C for Echo/Ping/Talk Commands.
23. Create a Socket (TCP) between two computers and enable file transfer between them.
24. Write a Program to implement Remote Command Execution.

B.Tech. II Year II Semester

Course Structure

L	T	P	C
0	0	3	1.5

DATABASE MANAGEMENT SYSTEMS LAB

(CSE)

Internal Marks : 40

Course Code: P18CSL03 **External Marks: 60**

Course Prerequisites: Nil

Course Objectives:

1. Understand, analyze and apply SQL commands like DDL,DML,DCL to perform different Database operations
2. Understand and practice PL/SQL block, control statements and cursors.
3. Develop PL/SQL programs using, functions, procedures, packages and Triggers.

Course Outcomes:

1. Know about SQL DDL,DML,DCL,TCL commands
2. Know how to write SQL Quires using set operators
3. Know about how to implement PL/SQL programs using conditional ,loops statements
4. Know about implementing of triggers, cursors and exceptions
5. Know about implementing procedures, functions and packages

PROGRAMS LIST

1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables).
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions, string functions and date functions
5. i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section
   ii)Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISEAPPLICATION ERROR.

8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
9. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
10. Write a PL/SQL block illustrating packages.
11. Write a PL/SQL code using CURSOR.

B.Tech II Year II Semester

Course Structure

L	T	P	C
3	0	0	0

INDIAN CONSTITUTION
(CSE)

Course Code: P18MCT03 **Internal Marks: 100**

Course Objectives:

1. To know about Indian constitution.
2. To know about central government functionalities in India.
3. To know about state government functionalities in India.
4. To know about functions of Indian Constitution
5. To know about Indian society.

Course Outcomes:

1. Understand the background and structure of Indian Constitution
2. Understand the functions of the Indian government
3. Understand the functions of the State government
4. Understand and abide the rules of the Indian constitution.
5. Understand and appreciate different culture among the people.

UNIT I: (9 Lectures)

INTRODUCTION: Historical Background – Constituent Assembly of India – Philosophical foundations of the Indian Constitution – Preamble – Fundamental Rights – Directive Principles of State Policy – Fundamental Duties – Citizenship – Constitutional Remedies for citizens.

UNIT II: (9 Lectures)

STRUCTURE AND FUNCTION OF CENTRAL GOVERNMENT: Union Government – Structures of the Union Government and Functions – President – Vice President – Prime Minister – Cabinet – Parliament – Supreme Court of India – Judicial Review.

UNIT III: (9 Lectures)

STRUCTURE AND FUNCTION OF STATE GOVERNMENT: State Government – Structure and Functions – Governor – Chief Minister – Cabinet – State Legislature – Judicial System in States – High Courts and other Subordinate Courts.

UNIT IV: (9 Lectures)

CONSTITUTION FUNCTIONS: Indian Federal System – Center – State Relations – President‟s Rule – Constitutional Amendments – Constitutional Functionaries – Assessment of working of the Parliamentary System in India.

UNIT V: (9 Lectures)

INDIAN SOCIETY: Society : Nature, Meaning and definition; Indian Social Structure; Caste, Religion, Language in India; Constitutional Remedies for citizens – Political Parties and Pressure Groups; Right of Women, Children and Scheduled Castes and Scheduled Tribes and other Weaker Sections.

Text Books:

1. Introduction to the Constitution of India, Durga Das Basu, Prentice Hall of India, New Delhi,1993.
2. Indian Political System, R.C.Agarwal, (1997) S.Chand and Company, New Delhi.
3. Society: An Introduction Analysis, Maciver and Page, Mac Milan India Ltd., New Delhi.
4. Social Stratification in India: Issues and Themes, K.L.Sharma, (1997) Jawaharlal Nehru University, New Delhi.

Reference Books:

1. Introduction to the Constitution of India:, Sharma, Brij Kishore, Prentice Hall of India, New Delhi,2005.
2. Indian Political System, U.R.Gahai, New Academic Publishing House, Jalaendhar,1998.
3. Indian Social Problems, R.N. Sharma, Media Promoters and Publishers Pvt. Ltd.
4. Constitution of India, Dr.P.K.Agarwal, Dr.K.N.Chaturvedi, PRABHAT

Web References:

1. www.india.gov.in
2. www.legislative.gov.in
3. www.constitution.org

B.Tech II Year II Semester

Course Structure

L	T	P	C
2	0	0	2

STATISTICS WITH R

(CSE)

Internal Marks : 40

Course Code: P18CSO01 **External Marks: 60**

Course Prerequisite: Statistics Basics

Course Objectives:

1. Understanding the R language concepts, graphics and modeling.
2. Outline different components of R language.
3. Fit some basic types of statistical models.
4. Be able to expand their knowledge of R on their own.
5. Use R in their own research.

Course Outcomes:

1. List motivation for learning a programming language.
2. Access online resources for R and import new function packages into the R workspace.
3. Import, review, manipulate and summarize data sets in R.
4. Explore data sets to create testable hypotheses and identify appropriate statistical tests.
5. Perform appropriate statistical tests using R Create and edit visualizations.

UNIT-I: (9 Lectures)

Introduction to R: Introduction, How to run R, Basic Math, Variables, Data Types, Vectors, R Sessions.

Data Structure Concepts: Advanced Data Structures, Data Frames, Lists, Matrices, Arrays, Factors, Classes**.**

UNIT-II: (9 Lectures)

Programming Using R: Conditional Statements, Loops, Sets, Operators, Functions-Default Values for Argument, Return Values, Deciding Whether to explicitly call return-Returning Complex Objects, Functions are Objective, Recursion-Examples.

UNIT-III: (9 Lectures)

Doing Math and Simulation in R: Math Function, Cumulative Sums and Products, Minima and Maxima- Calculus, Functions for Statistical Distribution, Sorting.

Linear Algebra Operation on Vectors and Matrices - Extended Example, Vector cross

Product- Extended Example-Finding Stationary Distribution of Markov Chains, Set Operation.

UNIT-IV: (9 Lectures)

File Operations: Input /output, Accessing the Keyboard and Monitor, Reading and writer Files.

Graphics: Creating Graphs, The Workhorse of R Base Graphics, the plot() Function, Customizing Graphs – Strip Charts, Histograms, Box plots, Pie charts, Scatter Plot Matrices, Saving Graphs to Files.

UNIT-V: (9 Lectures)

Probability Distributions: Normal Distribution, Binomial Distribution, Poisson Distribution, Other Distributions, Correlation and Covariance, T-Tests, ANOVA.

Linear & Non Linear Models: Simple Linear Regression, Multiple Regression, Logistic Regression, Poisson Regression, Nonlinear Models, Decision, Random Forests.

Text Books:

1. The Art of R Programming, Norman Matloff, Cengage Learning,2009.
2. R for Everyone, Lander, Pearson,2013.
3. Statistical Application Development with R and Python, Second Edition, Prabhanjan Narayanachar Tattar, 2017

Reference Books:

1. Statistics with R Programming, Dr. Sandip Rakshit, Mc Graw Hill, 2018.
2. R Cookbook, PaulTeetor, Oreilly, 2011.
3. R in Action,Rob Kabacoff, Manning, 2011.

Web References:

1. www.data-flair.training
2. www.hackr.io
3. www.imarticus.org

B.Tech II Year II Semester

Course Structure

L	T	P	C
2	0	0	2

INTRODUCTION TO MAT LAB

(CSE)

Internal Marks : 40

Course Code: P18CSO02 **External Marks: 60**

Course Prerequisite: NIL

Course Objective:

1. To understand the basic principles of programming and of implementing mathematical concepts by using MATLAB. Specifically, they will be able to write numerical algorithms and evaluate the computational results using graphical representations. The ultimate goal is to motivate the students for their profession and for future courses in curriculum.

Course Outcomes:

1. Translate mathematical methods to MATLAB code
2. Generalize results and represent data visually.
3. Students will be able to apply computer methods for solving a wide range of engineering problems
4. Students will be able to utilize computer skills to enhance learning and performance in other engineering and science courses
5. Students will be able to demonstrate professionalism in interactions with industry

UNIT-1: (9 Lectures)

Introduction To Mat Lab: Historical Background, Applications, Scope of MATLAB, Importance of MATLAB for Engineers, Features, MATLAB Windows (Editor, Work Space, Command History, Command Window).Installation procedure of MATLAB, Operations with Variables, Naming and Checking Existence, Clearing Operations, Commands, Data types, Operators.

UNIT-II: (9 Lectures)

Data And Data Flow In Mat Lab: Vectors, Matrix Operations & Operators, Reshaping Matrices, Arrays, Colon Notations, Numbers, Strings, Functions, File Input-Output, Importing and Exporting of data.

UNIT-III: (8 Lectures)

Matlab Programming: Conditional Statements, Loops, Writing Script Files, Error Correction, Saving Files, Worked out Examples.

UNIT-IV: (10 Lectures)

Matlab Advanced: Plotting, Graphics, Creating Plot & Editing Plot, GUI (Graphical User Interface). Matlab- Algebra, Calculus, Differential, Integration, Polynomials, solving a system of linear equations.

UNIT-V: (9 Lectures)

Simulink: Introduction, Importance, Model Based Design, Tools, Mathematical Modeling, Converting Mathematical Model into Simulink Model, Running Simulink Models, Importing Exporting Data, Solver Configuration, Masking Block/Model.

Text Books:

1. Getting Started With Matlab: A Quick Introduction For Scientists And Engineers (English) by Rudra Pratap, OXFORD University Press,2010.
2. Matlab Programming by Y. Kirani Singh, B.B. Chaudhuri, PHI Publication,2009.
3. Understanding MATLAB, A Textbook for Beginners by S.N. ALAM & S.S. ALAM,2007.
4. MATLAB Easy Way of Learning,S.Swapna Kumar,Lenina S V B,2016.

Reference Books:

1. MATLAB® Programming For Engineers Fourth edition by Stephen J. Chapman,2012.
2. Applied Numerical Methods Using MATLAB 1st Edition by Won Y. Yang , Wenwu Cao, Tae-Sang Chung, John Morris,2015.
3. Signal processing simulation using MATLAB by Dr. V.S.K REDDY & Dr.Y. Madhavee Latha,2013.

Web References:

1. www.ocw.mit.edu
2. www.learnrope.com
3. in.mathworks.com

B.Tech II Year II Semester

Course Structure

L	T	P	C
2	0	0	2

OBJECT ORIENTED PROGRAMMING THROUGH C++

(CSE)

Internal Marks : 40

Course Code: P18CSO04 **External Marks: 60**

Course Prerequisite: C Programming

Course Objectives:

1. To get a clear understanding of object-oriented concepts.
2. To understand object oriented programming through C++.

Course Outcomes:

1. Gain the basic knowledge on Object Oriented concepts.
2. Ability to develop applications using Object Oriented Programming Concepts.
3. Ability to implement features of object oriented programming to solve real world problems.

UNIT I: (9 Lectures)

Introduction to Object Oriented Programming: Need for Object Oriented Programming - Characteristics of Object Oriented Languages – Comparison of C and C++ - Structures: Structures - Enumerations – Functions: Simple Functions – Passing Arguments to Functions – Returning Values from Functions – Reference Arguments - Overloaded Functions – Recursion – Inline Functions –Default Arguments – Scope and Storage Class – Returning by Reference – const Function Arguments.

UNIT II: (9 Lectures)

Objects and Classes: A Simple Class – C++ Objects as Physical Objects – C++ Objects as Data types - Constructors – Objects as Function Arguments - Copy Constructor – Structures and Classes – Classes, Objects and Memory - Static class data – Constant Member functions and constant objects - Arrays and Strings: Array Fundamentals – Arrays as Class Member Data – Array of Objects – C-Strings – The Standard C++ String Class.

UNIT III: (9 Lectures)

Operator Overloading: Overloading Unary Operators – Overloading Binary Operators - Data Conversion – explicit and mutable keywords – Inheritance: Derived Class and Base Class – Derived Class Constructors – Overriding Member Functions – Which Function is Used – Class Hierarchies – Public and Private Inheritance – Levels of Inheritance- Multiple Inheritance – Ambiguity – Containership: Classes within classes.

UNIT IV: (9 Lectures)

Pointers: Address and Pointers – The Address of Operator - Pointers and Arrays – Pointers and Functions – Pointers and C-type Strings – Memory Management – Pointers to Objects – Pointers to Pointers - Virtual Functions: Virtual Functions - Friend Functions – Static Functions – Assignment and Copy Initialization – The this pointer – Dynamic Type Information.

UNIT V: (9 Lectures)

Streams: Stream Classes – Stream Errors — Overloading Extraction and Insertion Operators - Templates and Exceptions: Function Templates – Class Templates – Exception Handling- Types of Exceptions, Throwing Exceptions, Exception Classes. Multiple Throws and Catches, Uncaught Exceptions-Nested Try-Catch Blocks.

Text Books:

1. C++: The Complete Reference (4th Ed) – Schildt H. (TMH),1994.
2. The C++ Programming Language – Stroustrup B. (Addison-Wesley),2010.
3. C++:How to program-Deitel &Deitel,2008.
4. Let us C++' by Yashavant P. Kanetkar

Reference Books:

1. Teach Yourself C++, Al Stevens,1988.
2. A Structured Approach using C++, Farouzan & Gilberg,2012.
3. Object Oriented Programming with C++, R S Salaria,2017.
4. Object Oriented Programming With C++, E Balagurusamy, TMH
5. C++ Programming, Black Book, Steven Holzner, dreamtech,2000.
6. Object Oriented Programming in Turbo C++, Robert Lafore, Galgotia,1999.
7. Object Oriented Programming with ANSI and Turbo C++, Ashok Kamthane, Pearson,2003.
8. The Compete Reference C++, Herbert Schlitz, TMH

Web References:

1. www.cplusplus.com
2. www.stroustrup.com

B.Tech II Year II Semester

Course Structure

L	T	P	C
2	0	0	2

ENGINEERING MECHANICS
(CSE)

Internal Marks : 40

Course Code: P18CSO03 **External Marks: 60**

Course Prerequisites: Engineering Mathematics, Physics

Course Objectives:

1. Study various types of force systems, basic principles of mechanics of rigid bodies and Calculation the unknown forces through the use of equilibrium equations for a rigid body.
2. Analyze simple trusses using method of joints and method of sections
3. Study and determine centroids and centre of gravity of various composite shapes.
4. Study the concept of moment of inertia and the mathematical calculations involved in finding moments of inertia of two dimensional areas.
5. Learn principle of dynamics and apply it to impulse and momentum, work and energy which is useful to analyze turbo machineries.

Course Outcomes:

1. Apply the principle of rigid body equilibrium and to determine unknown forces.
2. Analyze the force of friction and trusses using method of Joints and method of sections.
3. Find the centroids and center of gravity of composite areas
4. Calculate the moment of inertia of various shapes by integration and moment of inertia of composite areas.
5. Understand kinematics, kinetics and rotation of a rigid body

UNIT – I: (9 Lectures)

Systems of forces: Resolution of coplanar and non-coplanar force systems (both concurrent and non-concurrent), Determining the resultant of planar force systems. Moment of force and its applications and couples.

Equilibrium of force system: Free body diagrams, equations of equilibrium of planar force systems and its applications. Problems on general case of force systems.

UNIT – II: (8 Lectures)

Analysis of Trusses*:* Introduction, force calculations using method of joints and method of sections.

Theory of friction: Introduction, types of friction, laws of friction, application of friction to a single body & connecting systems. Wedge friction

UNIT – III: (9 Lectures)

Centroid*:* Significance of centroid, moment of area, centroid of line elements, plane areas, composite areas, theorems of Pappus & its applications.

Center of gravity: CG of elementary and composite bodies

UNIT – IV: (9 Lectures)

Moment of Inertia: Definition of MI, Polar Moment of Inertia, radius of gyration, transfers theorem, moment of Inertia of elementary & composite areas, and product of inertia. Mass moments of inertia for elementary and composite bodies

UNIT – V: (10 Lectures)

Kinematics: Introduction, Rectilinear kinematics: Continuous motion, General curvilinear motion, Curvilinear motion: Rectangular components, Motion of a projectile, curvilinear motion: Normal and tangential components, Absolute dependent motion analysis of two particles.

Kinetics: Kinetics of a particle-D'Alemberts principle-Motion in a curved path – work, energy and power. Principle of conservation of energy- Kinetics of rigid body in translation, rotation work done-Principle of work-energy-Impulse-momentum.

Text Books:

1. Engineering mechanics-statics and dynamics by A. K. Tayal - Umesh publications, Delhi (For numerical problems) , 2008.
2. Engineering mechanics by S. Timoshenko, D. H. Young and J V Rao -Tata McGraw-Hill Publishing Company Limited, New Delhi(For concepts) , 2009.
3. Engineering Mechanics by Dr. R. Kumaravelan, Scitech Publications, 2014.

Reference Books:

1. Engineering Mechanics by S.S.Bhavikatti, New Age international Publishers 2012.
2. Engineering Mechanics- Statics and Dynamics by Irving H. Shames, Pearson Education, 2006.
3. Singer's Engineering Mechanics: Statics and Dynamics, K.Vijaya Kumar Reddy and J Suresh Kumar, 3rd Edition SI UNITs-BS Publications, 2010.
4. A Textbook of Engineering mechanics statics anddynamics by J. L. Meriam and L. Kraige , Wiley India , 6th Edition , 2010.

Web References:

1. www.smartzworld.com
2. www.lecturenotes.in