VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

(Permanently Affiliated to JNTUH, Approved by AICTE, New Delhi and Accredited by NBA, NAAC)

Shamshabad - 501 218, Hyderabad

BACHELOR OF TECHNOLOGY

INFORMATION TECHNOLOGY

ACADEMIC REGULATIONS (VCE R-14), COURSE STRUCTURE AND SYLLABUS

B.Tech. Regular Four Year Degree Programme

(For the batches admitted from the academic year 2014 - 2015)

&

B.Tech. (Lateral Entry Scheme)

(For the batches admitted from the academic year 2015 - 2016)

Note: The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already pursuing the program) as may be decided by the Academic Council.

PRELIMINARY DEFINITIONS AND NOMENCLATURES

- "Autonomous Institution / College" means an institution / college designated as autonomous institute / college by University Grants Commission (UGC), as per the UGC Autonomous College Statutes.
- "Academic Autonomy" means freedom to a College in all aspects of conducting its academic programs, granted by the University for promoting excellence.
- "Commission" means University Grants Commission.
- "AICTE" means All India Council for Technical Education.
- "University" the Jawaharlal Nehru Technological University, Hyderabad.
- "College" means Vardhaman College of Engineering, Hyderabad unless indicated otherwise by the context.
- "Program" means:
  Bachelor of Technology (B.Tech) degree program
  UG Degree Program: B.Tech
- "Branch" means specialization in a program like B.Tech degree program in Civil Engineering, B.Tech degree program in Computer Science and Engineering etc.
- "Course" or "Subject" means a theory or practical subject, identified by its course – number and course-title, which is normally studied in a semester. For example, A2001: Mathematics - I, A2501: Computer Programming, etc.
- T – Tutorial, P – Practical, D – Drawing, L - Theory, C - Credits

FOREWORD

The autonomy is conferred on Vardhaman College of Engineering by UGC based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the UGC in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own **curriculum, examination system and monitoring mechanism**, independent of the affiliating University but under its observance.

Vardhaman College of Engineering is proud to win the credence of all the above bodies monitoring the quality in education and has gladly accepted the responsibility of sustaining, if not improving upon the standards and ethics for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTU Hyderabad to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several expertise solicited from academics, industry and research, in accordance with the vision and mission of the college to order to produce quality engineering graduates to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications, if needed, are to be sought at appropriate time and with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The Cooperation of all the stake holders is sought for the successful implementation of the autonomous system in the larger interests of the college and brighter prospects of engineering graduates.

PRINCIPAL

DEPARTMENT OF INFORMATION TECHNOLOGY

VISION OF IT

The vision of the Department of Information Technology is to evolve as a centre of academic excellence in providing globally standard education and research in the field of Information Technology.

The department persistently works to mould young graduates into competitive, innovative, self disciplined and visionary computer professionals to meet global needs and challenges while maintaining a commitment to diversity and humanity

MISSION OF IT

The mission of the Department of Information Technology is to provide strong academic program in a state-of-the-art environment to advance theoretical, experimental, and applied computer science through universally recognized research by faculty and students.

Prepares the graduates for flexible career paths as computer scientists in industry, government and academia and continues advancement in computing and to support society by participating in and encouraging technology transfer.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOS)

PEO - I
To provide students with **core competence** in mathematical, scientific and basic engineering fundamentals necessary to formulate, analyze and solve hardware/software engineering problems and also to pursue advanced study or research.

PEO - II
To train students with good **breadth** of knowledge in core areas of Information Technology and related engineering so as to comprehend engineering trade-offs, analyze, design, and synthesize data and technical concepts to create novel products and solutions for the real time problems.

PEO - III
To **prepare** students to apply their knowledge and multifaceted skills to get immediate employment and excel in IT professional careers or awareness of the life-long learning needed to continue their education in IT or related post graduate programs to perform excellence, leadership and demonstrate good citizenship.

PEO - IV
To inculcate in students to maintain high **professionalism** and ethical standards, effective oral and written communication skills, to work as part of teams on multidisciplinary projects and diverse professional environments, and relate engineering issues to the society, global economy and to emerging technologies.

PROGRAMME OUTCOMES (POS)

(a) An ability to apply knowledge of mathematics, including discrete mathematics, probability, statistics, science, computer science and engineering, electronic engineering and electrical engineering as it applies to computer hardware and software **(fundamental engineering analysis skills).**

(b) An ability to design and conduct experiments, as well as to organize, analyze and interpret data to produce meaningful conclusions and recommendations **(information retrieval skills).**

(c) An ability to design hardware and software systems, components, or processes to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability **(creative skills).**

(d) An ability to work individually or as a member with responsibility to function on multi-disciplinary teams **(teamwork)**.

(e) An ability to identify, formulate, and solve hardware and software computing problems, accounting for the interaction between hardware and software **(engineering problem solving skills).**

(f) An understanding of professional, legal, ethical, security and social issues and responsibilities **(professional integrity).**

(g) An ability to communicate effectively in speech and in writing, including documentation of hardware and software systems **(speaking / writing skills).**

(h) Able to show the understanding of impact of engineering solutions in a global on the society, economic, environmental **(engineering impact assessment skills)**.

(i) Demonstrate an ability to acquire new knowledge in the computing discipline and to engage in life-long learning **(continuing education awareness)**.

(j) Knowledge of contemporary issues in the social sciences and the humanities using computational tools **(social awareness).**

(k) An ability to use the techniques, skills, and modern engineering tools necessary for computer engineering practice **(practical engineering analysis skills)**.

(l) An ability to apply engineering and management knowledge and techniques to estimate time and resources needed to complete a computer engineering project **(engineering and management skills).**

(m) An ability to recognize the importance of professional development by pursuing postgraduate studies or face competitive examinations that offer challenging and rewarding careers in computing **(successful career and immediate employment).**

For more information: www.vardhaman.org

ACADEMIC REGULATIONS

B.Tech. Regular Four Year Degree Programme
(for the batches admitted from the academic year 2014 - 15)
&
B.Tech. (Lateral Entry Scheme)
(for the batches admitted from the academic year 2015 - 16)

For pursuing four year undergraduate Bachelor Degree programme of study in Engineering (B.Tech) offered by Vardhaman College of Engineering under Autonomous status and herein after referred to as VCE:

1. APPLICABILITY

All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2014-2015 onwards. Any reference to "College" in these rules and regulations stands for Vardhaman College of Engineering.

2. EXTENT

All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies Principal, Vardhaman College of Engineering shall be the Chairman, Academic Council.

3. ADMISSION

3.1. Admission into first year of four year B.Tech degree programme of study in engineering:

3.1.1. Eligibility:

A candidate seeking admission into the first year of four year B.Tech degree programme should have

(i) Passed either Intermediate Public Examination (I.P.E) conducted by the Board of Intermediate Education, Telangana, with Mathematics, Physics and Chemistry as optional subjects or any equivalent examination recognized by Board of Intermediate Education, Telangana or a Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Telangana or equivalent Diploma recognized by Board of Technical Education for admission as per the guidelines of APSCHE.

(ii) Secured a rank in the EAMCET examination conducted by A.P. State Council for Higher Education for allotment of a seat by the Convener, EAMCET, for admission.

3.1.2. Admission Procedure:

Admissions are made into the first year of four year B.Tech. Degree programme as per the stipulations of A.P State Council of Higher Education (APSCHE), Government of Telangana.

(a) Category A seats are filled by the Convener, EAMCET.

(b) Category B seats are filled by the Management.

3.2. Admission into the second year of four year B.Tech degree programme in engineering

3.2.1. Eligibility:

A candidate seeking admission under lateral entry into the III semester B.Tech degree Programme should have passed the qualifying exam (B.Sc. Mathematics & Diploma holders), based on the rank secured by the candidate at Engineering Common Entrance Test ECET (FDH) in accordance with the instructions received from the Convener, ECET and Government of Telangana.

3.2.2. Admission Procedure:

Admissions are made into the III semester of four year B.Tech degree programme through Convener, ECET (FDH) against the sanctioned strength in each programme of study as lateral entry students.

4. PROGRAMS OFFERED

Vardhaman College of Engineering, an autonomous college affiliated to JNTUH, offers the following B.Tech programmes of study leading to the award of B.Tech degree under the autonomous scheme.

1) B.Tech (Civil Engineering)
2) B.Tech (Computer Science & Engineering)
3) B.Tech (Electrical & Electronics Engineering)
4) B.Tech (Electronics & Communication Engineering)
5) B.Tech (Information Technology)
6) B.Tech (Mechanical Engineering)

5. MEDIUM OF INSTRUCTION

The medium of instruction and examinations for all courses is English.

6. DURATION OF THE PROGRAMS

6.1 Normal Duration

6.1.1 B.Tech degree program extends over a period of four academic years leading to the Degree of Bachelor of Technology (B.Tech) of the Jawaharlal Nehru Technology University, Hyderabad.

6.1.2 For students admitted under lateral entry scheme, B.Tech degree program extends over a period of three academic years leading to the Degree of Bachelor of Technology (B.Tech) of the Jawaharlal Nehru Technology University, Hyderabad.

6.2 Maximum Duration

6.2.1 The maximum period within which a student must complete a full-time academic program is 8 years for B.Tech. If a student fails to complete the academic program within the maximum duration as specified above, he / she will be required to withdraw from the program.

6.2.2 For students admitted under lateral entry scheme in B.Tech degree program, the maximum period within which a student must complete a full-time academic program is 6 years. If a student fails to complete the academic program within the maximum duration as specified above, he / she will be required to withdraw from the program.

6.2.3 The period is reckoned from the academic year in which the student is admitted first time in to the degree programme.

7. SEMESTER STRUCTURE

The College shall follow semester pattern. An academic year shall consist of a first semester and a second semester and the summer term follows in sequence. Each semester shall be of 23 weeks duration and this period includes time for course work, examination preparation, and conduct of examinations. Each semester shall have a minimum of 85 working days for conducting classes. The academic calendar is shown in Table 1 is declared at the start of the semester.

The first and second semesters shall have the duration to accommodate a minimum of 16 instructional weeks per semester.

Table 1: Academic Calendar

FIRST SEMESTER (23 weeks)	Instruction Period : 17 weeks	19 weeks
	Mid Semester Tests : 2 weeks	
	Preparation & Practical Examinations	2 weeks
	External Examinations	2 weeks
Semester Break		2 weeks
SECOND SEMESTER (23 weeks)	Instruction Period : 17 weeks	19 weeks
	Mid Semester Tests : 2 weeks	
	Preparation & Practical Examinations	2 weeks
	External Examinations	2 weeks
Summer Vacation		4 weeks

8. COURSE STRUCTURE

Every programme of study shall be designed to have 42 - 45 theory courses and 14 - 16 laboratory courses.

The Programme of instruction consists of:

(i) A general core programme comprising Basic Sciences, Mathematics, Basic Engineering, Humanities, Social Sciences and Management.

(ii) An Engineering Core programme imparting to the student the fundamentals of engineering in the branch concerned.

(iii) An elective programme enabling the students to take up a group of departmental and interdepartmental courses of interest to him / her.

In addition, a student has to carry out a mini project, project work, technical seminar and comprehensive viva.

Every course of the B Tech programme will be placed in one of the ten groups of courses with minimum credits as listed in the Table 2.

Note: All components prescribed in the curriculum of any programme of study shall be conducted and evaluated.

Contact Periods: Depending on the complexity and volume of the course the number of contact periods per week will be assigned.

Table 2: Group of Courses

S. NO	GROUP OF COURSES	CATEGORY	MINIMUM CREDITS
1	Humanities, Social Sciences and Management	HS	14
2	Basic Sciences	BS	26
3	Basic Engineering	BE	32
4	Core Engineering	CE	114
5	Professional Elective	PE	12
6	Inter Departmental Elective	IE	08
7	Mini Project	MP	02
8	Technical Seminar	TS	02
9	Comprehensive Viva	CV	02
10	Project Work	PW	08
TOTAL			**220**

9. CREDIT BASED SYSTEM

All the academic programs under autonomy are based on credit system. Credits are assigned based on the following norms:

9.1. The duration of each semester will normally be 23 weeks with 6 days a week (the second and fourth Saturdays will be observed as holidays in a month). A working day shall have 6 periods each of 60 minutes duration.

Each course is normally assigned a certain number of credits as follows:

- 1 credit per lecture / tutorial period per week.
- 2 credits for three (or more) period hours of practicals.
- 2 credits for mini project.
- 2 credits for technical seminar with 6 periods per week.
- 2 credits for comprehensive viva examination.
- 8 credits for project work with 12 periods per week.

9.2. The four year curriculum of any B.Tech programme of study shall have total of 220 credits. The exact requirements of credits for each course will be as recommended by the Board of Studies concerned and approved by the Academic Council.

In the case of lateral entry students, B.Tech programme for III, IV, V, VI VII and VIII semesters of study shall have a total 168 credits.

9.3. For courses like mini project / project work / technical seminar / comprehensive viva, where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

10. METHOD OF EVALUATION

The performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks each for theory and 75 marks for practical / computer aided engineering drawing lab. In addition, mini-project, technical seminar, comprehensive viva and project work shall be evaluated for 50, 50, 50 and 200 marks respectively.

10.1 Theory Courses

The evaluation of the students in a course is a continuous process and is based on their performance in different examinations as mentioned below:

Mid Semester Test	20 Marks
Online Objective Test	05 Marks
End Semester Examination	75 Marks

10.1.1. Mid Semester Test

There will be two Mid Semester Tests in theory courses for a maximum of 20 marks to be answered in two hours duration. The first Mid Semester Test will be held in the 09th week with the announced schedule in the first two units of syllabus. The second Mid Semester Test will be held in the 18th week with the announced schedule in the last three units of syllabus. In case a student does not appear in the Mid Semester Test due to any reason whatsoever, will get zero marks(s).

10.1.2. Online Objective Test

There will be one Online Objective Test in Theory Courses for a maximum of 05 marks to be answered in half an hour duration. The Online Objective Test will be held in the 18th week with the announced schedule in all the units of syllabus. In case a student does not appear in the Online Objective Test due to any reason whatsoever, will get zero marks(s).

10.1.3. End Semester Examination

The end semester examination question paper in theory courses will be for a maximum of 75 marks to be answered in three hours duration. There shall be two questions of descriptive type from each unit with internal choice. Each question carries 15 marks. Each theory course shall consist of five units of syllabus.

The question paper shall be set externally and valued both internally and externally. If the difference between the first and second valuations is less than or equal to 15% of the maximum of the paper the better of the two valuations shall be awarded and if the difference between the first and second valuation is more than 15%, the chief examiner appointed has to discuss with the two valuers and have his own assessment of the script. The marks given by the chief examiner shall be final for award.

10.2 PRACTICALS

Practicals shall be evaluated for 75 marks, out of which 50 marks are for external examination and 25 marks are for internal evaluation. The 25 internal marks are distributed as 15 marks for day-to-day work/attendance and 10 marks for internal examination. The external end - examination shall be conducted by the teacher concerned and an external examiner from outside the college.

12 out of 14 to 16 experiments / exercises recommended are to be completed in a semester.

10.3. For Engineering Drawing, Advanced Engineering Drawing and Machine Drawing the distribution shall be 25 marks for internal evaluation (15 marks for day-to-day work/attendance and 10 marks for internal tests) and 75 marks for end examination. There shall be two internal evaluations in a semester and the average of the two internal evaluations is considered for the award of marks for internal marks.

10.4. The Computer Aided Engineering Drawing Lab, Computer Aided Aircraft Engineering Drawing Lab wherever offered is to be treated as a practical subject. Evaluation method adopted for practical subjects shall be followed here as well.

10.5. Mini Project

The mini project in an industry shall be carried out during the summer break for a minimum of 4 weeks after the VI Semester and completed before the start of the VII semester. A report has to be submitted for assessment to an internal evaluation committee comprising Head of the Department or his / her nominee and two faculty of the department including the project supervisor for 50 marks. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits. The mini project and its report shall be evaluated in VII semester.

10.6 Technical Seminar

The seminar shall have two components, one chosen by the student from the course-work without repetition and approved by the faculty supervisor. The other component is suggested by the supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work. A hard copy of the information on seminar topic in the form of a report is to be submitted for evaluation along with presentation. The presentation of the seminar topics shall be made before an internal evaluation committee comprising the Head of the Department or his/her nominee, seminar supervisor and a senior faculty of the department. The two components of the seminar are distributed between two halves of the semester and are evaluated for 50 marks each. The average of the two components shall be taken as the final score. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits.

10.7. Comprehensive Viva

The comprehensive Viva will be conducted by a committee comprising Head of the Department or his/her nominee, two senior faculty of the respective department and an external examiner from outside the college. This is aimed at assessing the student's understanding of various subjects studied during the entire program of 4 years. The comprehensive viva shall be evaluated for 50 marks at the end of VIII semester. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits.

10.8. Project Work

The project work shall be evaluated for 200 marks out of which 50 marks for internal evaluation and 150 marks for end-semester evaluation. The project work shall be spread over in VII semester and in VIII semester. The project work shall be somewhat innovative in nature, exploring the research bent of mind of the student. A project batch shall comprise of not more than four students.

At the end of VII semester, students should submit synopsis summarizing the work done in VII semester. The project is expected to be completed by the end of VIII semester.

In VIII semester a mid-course review is conducted by Head of the Department and the project supervisor on the progress for 25 marks. On completion of the project a second evaluation is conducted for award of internal marks of another 25 marks before the report is submitted making the total internal marks 50. The end semester examination shall be based on the report submitted and a viva-voce exam for 150 marks by committee comprising of the Head of the Department, project supervisor and an external examiner. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits.

11. ATTENDANCE REQUIREMENTS TO APPEAR FOR THE SEMESTER-END EXAMINATION

11.1. A student shall be eligible to appear for semester-end examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.

11.2. Condonation of shortage of attendance in aggregate upto 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.

11.3. Shortage of attendance below 65% in aggregate shall in no case be condoned.

11.4. The shortage of attendance shall not be condoned more than four times during the entire course.

11.5. Students whose shortage of attendance is not condoned in any semester are not eligible to take their semester-end examination of that class and their registration shall stand cancelled.

11.6. A student will not be promoted to the next semester unless he satisfies the attendance requirements of the current semester. The student may seek readmission for the semester when offered next. He will not be allowed to register for the subjects of the semester while he is in detention. A student detained due to shortage of attendance, will have to repeat that semester when offered next.

11.7. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

11.8. Attendance may also be condoned as per the recommendations of academic council for those who participate in prestigious sports, co-curricular and extra-curricular activities provided as per the Govt. of Telangana norms in vogue.

12. MISSING EXAMINATION

A student who fails to attend a Mid Semester Test / Online Objective Test due to hospitalization or accident shall be permitted with prior approval of the HOD and the Principal to take up missing examination of the particular course, subject to payment of a prescribed fee for each missing examination. Students deputed for official programmes of the college are exempted from paying the fee for missing test. Such missing examinations should be completed outside the regular class hours within 7 working days of the respective examinations. Attendance will not be given for taking up missing examinations. The missing examinations are allowed only for Mid Semester Test / Online Objective Test and not for end semester final theory and practical examinations.

13. EVALUATION

Following procedure governs the evaluation.

13.1. Marks for components evaluated internally by the faculty should be submitted to the Controller of Examinations one week before the commencement of the semester-end examinations. The marks for the internal evaluation components will be added to the external evaluation marks secured in the semester-end examinations, to arrive at total marks for any subject in that semester.

13.2. Performance in all the courses is tabulated course-wise and will be scrutinized by the Examination Committee and moderation is applied if needed, based on the recommendations of moderation committee and course-wise marks lists are finalized.

13.3. Student-wise tabulation is done and student-wise memorandum of marks is generated which is issued to the student.

14. PERSONAL VERIFICATION

Students shall be permitted for personal verification of the semester-end examination answer scripts within a stipulated period after payment of prescribed fee.

15. SUPPLEMENTARY EXAMINATION

Supplementary examinations for the odd semester shall be conducted with the regular examinations of even semester and vice versa, for those who appeared and failed in regular examinations. Such of the candidates writing supplementary examinations may have to write more than one examination per day.

16. ACADEMIC REQUIREMENTS FOR PROMOTION / COMPLETION OF REGULAR B.TECH PROGRAMME OF STUDY

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion / completion of regular B.Tech programme of study.

FOR STUDENTS ADMITTED INTO B.TECH. (REGULAR) PROGRAMME

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project, if he secures not less than 35% of marks in the semester-end examination and a minimum of 40% of marks in the sum of the internal evaluation and semester - end examination taken together.

ii. In case of mini project, technical seminar and comprehensive viva a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each of them if he/she secures not less than 40% of marks.

iii. In case of project work, a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted if he/she secures not less than 40% of marks on the aggregate in the internal evaluation and external end-evaluation taken together.

iv. A student shall be promoted from IV semester to V semester of programme of study only if he fulfils the academic requirement of securing 40 out of 80 credits from the regular examinations held up to the end of III semester including supplementary examinations held up to the end of IV semester.

v. A student shall be promoted from VI semester to VII semester of programme of study only if he fulfils the academic requirements of securing 68 out of 136 credits, from the regular examinations held up to the end of V semester including supplementary examinations held up to the end of VI semester.

vi. A student shall register for all the 220 credits and earn at least 212 credits. Marks obtained in all the 212 credits shall be considered for the award of the class based on aggregate of marks.

vii. A student who fails to earn 212 credits as indicated in the course structure within **eight** academic years from the year of their admission shall forfeit their seat in B.Tech programme and their admission stands cancelled.

viii. Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted. However, all such readmitted students shall earn all the credits of subjects they have pursued for completion of the course.

FOR LATERAL ENTRY STUDENTS (BATCHES ADMITTED FROM 2015–2016)

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project if he secures not less than 35% of marks in the semester-end examination and a minimum of 40% of marks in the sum total of the internal evaluation and semester-end examination taken together.

ii. In case of mini project, technical seminar and comprehensive viva a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each of them if he/she secures not less than 40% of marks.

iii. In case of project work, a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted if he/she secures not less than 40% of marks on the aggregate in the internal evaluation and external end-evaluation taken together.

iv. A student shall be promoted from VI semester to VII semester only if he fulfils the academic requirements of securing 42 out of 84 credits from the regular examinations held up to the end of V semester including supplementary examinations held up to the end of VI semester.

v. A student shall register for all 168 credits and earn at least 160 credits. Marks obtained in all the 160 credits shall be considered for the award of the class based on aggregate of marks.

vi. A student who fails to earn 160 credits as indicated in the course structure within **six** academic years from the year of their admission shall forfeit their seat in B.Tech programme and their admission stands cancelled.

vii. Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester

from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted. However, all such readmitted students shall earn all the credits of subjects they have pursued for completion of the course.

17. TRANSITORY REGULATIONS

Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted. A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of eight years, and a lateral entry student within six years, for the award of B.Tech Degree.

18. TRANSFER OF STUDENTS FROM OTHER COLLEGES/UNIVERSITIES

Transfer of students from the Constituent Colleges of *JNTUH* or from other Colleges/Universities shall be considered only on a case-to-case basis by the Academic Council of the Institute.

19. TRANSCRIPTS

After successful completion of the entire programme of study, a transcript containing performance of all academic years will be issued as a final record. Transcripts will also be issued, if required, after payment of requisite fee. Partial transcript will also be issued upto any point of study to a student on request, after payment of requisite fee.

20. AWARD OF DEGREE

The degree will be conferred and awarded by Jawaharlal Nehru Technological University, Hyderabad on the recommendations of the Chairman, Academic Council.

20.1. FOR STUDENTS ADMITTED INTO B.TECH. (REGULAR) PROGRAMME

Eligibility: A student shall be eligible for the award of B.Tech. Degree, if he fulfills all the following conditions:

- The candidate shall pursue a course of study for not less than four academic years and not more than eight academic years.
- The candidate shall register for 220 credits and secure at least 212 credits with compulsory subjects as listed in the Table below.

Serial Number	Subject Particulars
1	All First Year Theory Subjects
2	All practical subjects
3	Industry oriented mini project
4	Comprehensive Viva-voce
5	Seminar
6	Project work

- Obtained not less than 40% of marks (minimum requirement for declaring as passed).
- Has no dues to the college, hostel, and library etc. and to any other amenities provided by the College.
- No disciplinary action is pending against him.

20.2. FOR LATERAL ENTRY STUDENTS (BATCHES ADMITTED FROM 2015–2016)

Eligibility: A student shall be eligible for the award of B.Tech. Degree, if he fulfills all the following conditions:

- The candidate shall pursue a course of study for not less than three academic years and not more than six academic years.

- The candidate shall register for 168 credits and secure at least 160 credits with compulsory subjects as listed in the Table below.

Serial Number	Subject Particulars
1	All practical subjects
2	Industry oriented mini project
3	Comprehensive Viva-voce
4	Seminar
5	Project work

- Obtained not less than 40% of marks (minimum requirement for declaring as passed).
- Has no dues to the college, hostel, and library etc. and to any other amenities provided by the College.
- No disciplinary action is pending against him.

20.3. AWARD OF CLASS

After a student has satisfied the requirement prescribed for the completion of the programme and is eligible for the award of B.Tech. Degree he shall be placed in one of the following four classes Shown in Table 4:

Table 4: Declaration of Class is based on percentage of marks to be secured

Class Awarded	Percentage of Marks to be Secured	
First Class with Distinction	70% and above	From the aggregate marks secured from 212 Credits for Regular Students and 160 Credits for Lateral Entry Students.
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	
Fail	Below 40%	

Sometimes, it is necessary to provide equivalence of percentages and/or *Class* awarded with *Grade Point Average (GPA).* This shall be done by prescribing certain specific thresholds in averages for *Distinction, First Class and Second Class,* as in Table 5.

Table 5: Percentage Equivalence of *Grade Points* (For a 10-Point Scale)

Grade Points (GP)	Percentage of Marks
4.75	≥ 40 and < 45
5.25	≥ 45 and < 50
5.75	≥ 50 and < 55
6.25	≥ 55 and < 60
6.75	≥ 60 and < 65
7.25	≥ 65 and < 70
7.75	≥ 70 and < 75
8.25	≥ 75 and < 80

8.75	≥ 80 and < 85
9.25	≥ 85 and < 90
9.75	≥ 90 and < 95
10	≥ 95

21. ADDITIONAL ACADEMIC REGULATIONS

i. Courses like projects / mini projects / seminars can be repeated only by re-registering for all the components in that semester.

ii. When a student is absent for any examination (internal or external) he is treated as to have obtained absent in that component (course) and aggregate of marks is done accordingly.

iv. When a component is cancelled as a penalty, he is awarded zero marks in that component.

22. REGISTRATION

22.1. Each student has to compulsorily register for course work at the beginning of each semester as per the schedule mentioned in the Academic Calendar IN PERSON. It is absolutely compulsory for the student to register for courses in time. IN ABSENTIA registration will not be permitted under any circumstance.

22.2. Registration without fine: The courses prescribed for a semester can be registered on the date scheduled in the academic calendar. The registration is also permitted on the second day (which is the first working day of the semester) without fine.

22.3. Registration with fine: Late registration shall be permitted by the HOD concerned up to seven working days inclusive of the date of registration on payment of a late registration fee of stipulated amount.

22.4. Procedure to get permission for late registration: The student concerned shall apply with proper reason to the HOD concerned through the Academic Counselor to get the permission of the Dean (UG) for the late registration of the courses. Beyond the prescribed time limit, no student shall be permitted to register the courses for a particular semester.

23. TERMINATION FROM THE PROGRAM

The admission of a student to the program may be terminated and the student is asked to leave the college in the following circumstances:

i. The student fails to satisfy the requirements of the program within the maximum period stipulated for that program.

ii. The student fails to satisfy the norms of discipline specified by the institute from time to time.

24. CURRICULUM

24.1 For each program being offered by the Institute, a Board of Studies (BOS) is constituted in accordance with AICTE / UGC / JNTUH statutes.

24.2. The BOS for a program is completely responsible for designing the curriculum once in two years for that program.

25. WITH-HOLDING OF RESULTS

If the candidate has not paid any dues to the college / if any case of indiscipline / malpractice is pending against him, the results of the candidate will be withheld. The issue of the degree is liable to be withheld in such cases.

26. GRIEVANCES REDRESSAL COMMITTEE

"Grievance and Redressal Committee" (General) constituted by the principal shall deal with all grievances pertaining to the academic / administrative / disciplinary matters. The composition of the complaints cum redressal committee shall be:

Headed by Senior Faculty member
Heads of all departments
A senior lady staff member from each department (if available)

The committee constituted shall submit a report to the principal of the college, the penalty to be imposed. The Principal upon receipt of the report from the committee shall, after giving an opportunity of being heard to the person complained against, submit the case with the committee's recommendation to the Governing Body of the college. The Governing Body shall confirm with or without modification the penalty recommended after duly following the prescribed procedure.

27. MALPRACTICE PREVENTION COMMITTEE

A malpractice prevention committee shall be constituted to examine and punish the students who does malpractice / behaves indiscipline in examinations. The committee shall consist of:

Principal.
Subject expert of which the subject belongs to.
Head of the department of which the student belongs to.
The invigilator concerned.
In-charge Examination branch of the college.

The committee constituted shall conduct the meeting on the same day of examination or latest by next working day to the incidence and punish the student as per the guidelines prescribed by the J N T University, Hyderabad from time to time.

Any action on the part of candidate at the examination like trying to get undue advantage in the performance at examinations or trying to help another, or derive the same through unfair means is punishable according to the provisions contained hereunder. The involvement of the Staff, who are in charge of conducting examinations, valuing examination papers and preparing / keeping records of documents relating to the examinations in such acts (inclusive of providing incorrect or misleading information) that infringe upon the course of natural justice to one and all concerned at the examination shall be viewed seriously and recommended for award of appropriate punishment after thorough enquiry.

28. AMENDMENTS TO REGULATIONS

The Academic Council of Vardhaman College of Engineering reserves the right to revise, amend, or change the regulations, scheme of examinations, and / or syllabi or any other policy relevant to the needs of the society or industrial requirements etc., without prior notice.

29. STUDENTS' FEEDBACK

It is necessary for the Colleges to obtain feedback from students on their course work and various academic activities conducted. For this purpose, suitable feedback forms shall be devised by the College and the feedback obtained from the students regularly in confidence, by administering the feedback form in print or on-line in electronic form.

The feedback received from the students shall be discussed at various levels of decision making at the College and the changes/ improvements, if any, suggested shall be given due consideration for implementation.

30. GRADUATION DAY

The College shall have its own annual *Graduation Day* for the award of Degrees to students completing the prescribed academic requirements in each case, in consultation with the University and by following the provisions in the Statute.

The College shall institute Prizes and Awards to meritorious students, for being given away annually at the *Graduation Day.* This will greatly encourage the students to strive for excellence in their academic work.

31. AWARD OF A RANK UNDER AUTONOMOUS SCHEME

31.1. Merit Rank will be declared only for those students who have been directly admitted in VCE under Autonomous Regulations and complete the entire course in VCE only within the minimum possible prescribed time limit, i.e., 4 years for B.Tech, 3 years for B.Tech under lateral entry scheme.

31.2. A student shall be eligible for a merit rank at the time of award of degree in each branch of Bachelor of Technology, provided the student has passed all subjects prescribed for the particular degree program in first attempt only.

31.3. Academic performance will be the sole criteria for awarding the merit rank and will be based only on performance of the student from the first to the eighth semester of the course.

31.4. The number of Merit Ranks to be announced for any course / program / branch / specialisation will be as follows:

- **3** (Three) Merit Ranks if the AICTE sanctioned intake is less than or up to 60.
- **4** (Four) Merit Ranks if the AICTE sanctioned intake is greater than 60.
- **5** (Five) Merit Ranks if the AICTE sanctioned intake is greater than 120.

31.5. Award of prizes, scholarships, or any other Honours shall be based on the rank secured by a candidate, consistent with the guidelines of the Donor, wherever applicable.

32. CONDUCT AND DISCIPLINE

32.1 Each student shall conduct himself / herself in a manner befitting his / her association with VCE.

32.2 He / she is expected not to indulge in any activity, which is likely to bring disrepute to the college.

32.3 He / she should show due respect and courtesy to the teachers, administrators, officers and employees of the college and maintain cordial relationships with fellow students.

32.4 Lack of courtesy and decorum unbecoming of a student (both inside and outside the college), wilful damage or removal of Institute's property or belongings of fellow students, disturbing others in their studies, adoption of unfair means during examinations, breach of rules and regulations of the Institute, noisy and unruly behaviour and similar other undesirable activities shall constitute violation of code of conduct for the student.

32.5 **Ragging in any form is strictly prohibited and is considered a serious offence. It will lead to the expulsion of the offender from the college.**

32.6 Violation of code of conduct shall invite disciplinary action which may include punishment such as reprimand, disciplinary probation, debarring from the examination, withdrawal of placement services, withholding of grades / degrees, cancellation of registration, etc., and even expulsion from the college.

32.7 Principal, based on the reports of the warden of Institute hostel, can reprimand, impose fine or take any other suitable measures against an inmate who violates either the code of conduct or rules and regulations pertaining to college hostel.

32.8 A student may be denied the award of degree / certificate even though he / she has satisfactorily completed all the academic requirements if the student is found guilty of offences warranting such an action.

32.9 Attendance is not given to the student during the suspension period.

33. OTHER ISSUES

The quality and standard of engineering professionals are closely linked with the level of the technical education system. As it is now recognized that these features are essential to develop the intellectual skills and knowledge of these professionals for being able to contribute to the society through productive and satisfying careers as *innovators, decision makers and/or leaders* in the global economy of the 21st century, it

becomes necessary that certain improvements are introduced at different stages of their education system. These include:

a. Selective admission of students to a programme, so that merit and aptitude for the chosen technical branch or specialization are given due consideration.

b. Faculty recruitment and orientation, so that qualified teachers trained in good teaching methods, technical leadership and students' motivation are available.

c. Instructional/Laboratory facilities and related physical infrastructure, so that they are adequate and are at the contemporary level.

d. Access to good library resources and Information & Communication Technology **(ICT)** facilities, to develop the student's *mind* effectively.

These requirements make it necessary for the College to introduce improvements like:

a. Teaching-learning process on modern lines, to provide *Add-On* Courses for *audit*/credit in a number of peripheral areas useful for students' self development.

b. Life-long learning opportunities for faculty, students and alumni, to facilitate their dynamic interaction with the society, industries and the world of work.

c. Generous use of ICT and other modern technologies in everyday activities.

34. GENERAL

Where the words "he", "him", "his", "himself" occur in the regulations, they include "she", "her", "herself".

Note: Failure to read and understand the regulations is not an excuse.

COURSE STRUCTURE

B. TECH - INFORMATION TECHNOLOGY

REGULATIONS: VCE-R14

I SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A2005	Technical English	HS	4	-	-	4	25	75	100
A2001	Mathematics – I	BS	3	1	-	4	25	75	100
A2004	Probability Theory and Numerical Methods	BS	3	1	-	4	25	75	100
A2201	Basic Electrical Engineering	BE	4	-	-	4	25	75	100
A2501	Computer Programming	BE	3	1	-	4	25	75	100
A2009	English Language Communication Skills Lab	HS	-	-	3	2	25	50	75
A2502	Computer Programming Lab	BE	-	-	6	2	25	50	75
A2601	IT Workshop	BE	-	-	3	2	25	50	75
		TOTAL	17	03	12	26	200	525	725

II SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A2006	Mathematics - II	BS	3	1	-	4	25	75	100
A2002	Engineering Physics	BS	4	-	-	4	25	75	100
A2003	Engineering Chemistry	BS	4	-	-	4	25	75	100
A2402	Electronic Devices and Circuits	BE	3	1	-	4	25	75	100
A2503	Data Structures through C	BE	3	1	-	4	25	75	100
A2008	Engineering Physics and Engineering Chemistry Lab	BS	-	-	3	2	25	50	75
A2405	Electronic Devices and Circuits Lab	BE	-	-	3	2	25	50	75
A2504	Data Structures through C Lab	BE	-	-	6	2	25	50	75
		TOTAL	17	03	12	26	200	525	725

III SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A2012	Managerial Economics and Financial Analysis	HS	4	-	-	4	25	75	100
A2505	Discrete Mathematical Structures	CE	3	1	-	4	25	75	100
A2406	Digital Logic Design	CE	3	1	-	4	25	75	100
A2506	Operating Systems	CE	4	-	-	4	25	75	100
A2510	Computer Architecture and Organization	CE	3	1	-	4	25	75	100
A2508	Object Oriented Programming through Java	BE	4	-	-	4	25	75	100
A2509	JAVA Programming Lab	BE	-	-	3	2	25	50	75
A2306	Computer Aided Engineering Drawing Lab	BE	-	-	3	2	25	50	75
		TOTAL	21	03	06	28	200	550	750

B. TECH - INFORMATION TECHNOLOGY

REGULATIONS: VCE-R14

IV SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A2011	Environmental Science	BS	4	-	-	4	25	75	100
A2507	Design and Analysis of Algorithms	CE	3	1	-	4	25	75	100
A2511	Formal Languages and Automata Theory	CE	3	1	-	4	25	75	100
A2512	Software Engineering	CE	4	-	-	4	25	75	100
A2513	Unix Programming	CE	4	-	-	4	25	75	100
A2514	Database Management Systems	CE	3	1	-	4	25	75	100
A2515	Unix Programming Lab	CE	-	-	3	2	25	50	75
A2516	Database Management Systems Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

V SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A2419	Microprocessors and Interfacing	CE	4	-	-	4	25	75	100
A2517	Compiler design	CE	3	1	-	4	25	75	100
A2602	Computer Networks	CE	3	1	-	4	25	75	100
A2603	Web Technologies	CE	3	1	-	4	25	75	100
A2604	Mobile Application Development	CE	4	-	-	4	25	75	100
A2605	Wireless and Mobile Computing	CE	4	-	-	4	25	75	100
A2424	Microprocessors and Interfacing Lab	CE	-	-	3	2	25	50	75
A2606	Web Technologies Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

VI SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A2425	Embedded Systems	CE	4	-	-	4	25	75	100
A2520	Object Oriented Analysis and Design	CE	3	1	-	4	25	75	100
A2523	Data Mining and Data Warehousing	CE	4	-	-	4	25	75	100
A2607	Network Security and Cryptography	CE	3	1	-	4	25	75	100
A2608	Open Source Technologies	CE	3	1	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE - I	HS	4	-	-	4	25	75	100
A2609	Open Source Technologies Lab	CE	-	-	3	2	25	50	75
A2610	Case Tools and Data Mining Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH - INFORMATION TECHNOLOGY

REGULATIONS: VCE-R14

VII SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A2522	Software Project Management	CE	4	-	-	4	25	75	100
A2611	Cloud Computing	CE	4	-	-	4	25	75	100
A2612	Cyber Security	CE	3	1	-	4	25	75	100
A2613	Software Testing and Quality Assurance	CE	3	1	-	4	25	75	100
INTERDEPARTMENTAL ELECTIVE - II		IE	4	-	-	4	25	75	100
PROFESSIONAL ELECTIVE - I		PE	3	1	-	4	25	75	100
A2618	Cloud Computing Lab	CE	-	-	3	2	25	50	75
A2619	Software Testing and Quality Assurance Lab	CE	-	-	3	2	25	50	75
A2620	Mini Project	MP	-	-	-	2	-	50	50
	TOTAL		**21**	**03**	**06**	**30**	**200**	**600**	**800**

VIII SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A2015	Professional Ethics and Intellectual Property Rights	HS	3	1	-	4	25	75	100
PROFESSIONAL ELECTIVE - II		PE	3	1	-	4	25	75	100
PROFESSIONAL ELECTIVE - III		PE	3	1	-	4	25	75	100
A2537	Industry Oriented Design Lab	CE	-	-	6	2	25	50	75
A2631	Technical Seminar	TS	-	-	6	2	50	-	50
A2632	Comprehensive Viva	CV	-	-	-	2	-	75	75
A2633	Project Work	PW	-	-	12	8	50	150	200
	TOTAL		**09**	**03**	**24**	**26**	**200**	**500**	**700**

ELECTIVES	
INTERDEPARTMENTAL ELECTIVE - I	
Code	**Subject**
A2013	Management Science
A2016	Human Resource Management
A2017	Entrepreneurship
A2018	Business Communication
A2019	Project Planning and Management
A2020	Organizational Behavior
INTERDEPARTMENTAL ELECTIVE – II	
A2532	Distributed Databases
A2220	Power Electronics
A2426	VLSI design
A2333	Operations Research
A2351	Robotics
A2154	Air Pollution and Control Methodologies
PROFESSIONAL ELECTIVE - I	
A2525	Rational Application Developer
A2527	Distributed Operating Systems
A2614	Computer Graphics
A2615	Building Enterprise Applications
A2616	Image Processing and Pattern Recognition
A2617	Bioinformatics
PROFESSIONAL ELECTIVE - II	
A2530	Grid Computing
A2621	Big Data
A2622	Service Oriented Architecture
A2623	Geographical Information Systems
A2624	Human Computer Interaction
A2625	Multimedia and Rich Internet Applications
PROFESSIONAL ELECTIVE - III	
A2536	Soft Computing
A2626	Information Retrieval Systems
A2627	Semantic Web and Social Networks
A2628	Game Development Using CUDA
A2629	Network Management System
A2630	Ad- Hoc and Sensor Networks

SYLLABI FOR I, II, III & IV SEMESTERS

I Year B. Tech. IT - I Semester

TECHNICAL ENGLISH

(Common to CSE / IT / EEE)

Course Code: **A2005**

L	T	P	C
4	-	-	4

UNIT I

- Chapter entitled ***Heaven's Gate*** From Enjoying Everyday English published by Orient Black Swan, Hyderabad.
- Chapter entitled ***Mother Teresa*** from Inspiring speeches and lives Published by Maruthi Publication, Hyderabad.

  Grammar: Articles – Prepositions

  Vocabulary: Word formation with Prefixes and suffixes – Synonyms and Anonyms –Homonyms, Homophones and Homographs – Idiomatic Expressions –Phrasal Verbs

  Writing: Paragraph Writing.

UNIT II

- Chapter entitled ***The Connoisseur*** From Enjoying Everyday English published by Orient Black Swan, Hyderabad.
- Chapter entitled ***Sam Pitroda*** from Inspiring speeches and lives Published by Maruthi Publication, Hyderabad.

  Grammar: Concord (Subject verb Agreement) - Adjectives and Degrees of Comparisons

  Vocabulary: Word formation with Prefixes and suffixes- Synonyms and Anonyms-Collocations-One word substitutes

  Writing: Letter Writing: Types of letters, Styles of letters, Parts of letters, Letter of Apology and reply, Letter of Complain and Reply.

Unit III

- Chapter entitled ***The Odds Against Us*** From Enjoying Everyday English published by Orient Black Swan, Hyderabad.
- Chapter entitled ***I have a Dream by Martin Luther King*** from Inspiring speeches and lives Published by Maruthi Publication, Hyderabad.

  Grammar: Tenses, Question Tags

  Vocabulary: Technical Vocabulary, Word formation with Prefixes and suffixes- Synonyms and Anonyms Morphemes

  Writing: Speech Writing, Dialogue and Speech Writing, Writing Technical Articles

UNIT IV

- Chapter entitled ***The Cuddalore Experience*** *From* Enjoying Everyday English published by Orient Black Swan, Hyderabad.

  Grammar: Active and Passive Voice,

  Vocabulary: Synonyms and Anonyms, Words often confused/misspelled

  Writing: Letter of Application and Preparation of Resume

UNIT V

- Chapter entitled ***Obama*** from Inspiring speeches and lives Published by Maruthi Publication, Hyderabad.

  Grammar: Simple, Compound and Complex - Direct and indirect Speech-

  Vocabulary: One word substitutes and Technical Vocabulary

  Writing: Report Writing –Types of reports, importance of Reports, Styles of Reports, Structure of Reports –Writing informational, Progress Reports and Analytical Reports in Technical Contexts

TEXT BOOKS:

1. A Ramakrishna Rao (2009) *Enjoying Everyday English. Hyderabad: Sangam Books*
2. B Yadava Raju and C Muralikrishna (2009). *Inspiring Speeches and Lives*. Guntur: Maruthi Publications
3. Meenakshi Raman & Sangeeta Sharma, (2009), *Technical Communicatio,* Oxford University Press.

REFERENCE BOOKS:

1. Ashraf Rizvi, M (2005) *Effective Technical Communication*. New Delhi: Tata Mc Graw Hill.
2. David Green (2010) *Contemporary English Grammar Structures and Composition* by, MacMillan Publishers, New Delhi.2010.
3. Meenakshi Raman, *Business Communication with CD*, 2nd Edition, Oxford University Press.
4. Meenakshi Raman, *Technical Communication*, Oxford University Press.

I Year B. Tech. IT - I Semester

MATHEMATICS – I

(Common to all Branches)

Course Code: **A2001**

L	T	P	C
3	1	-	4

UNIT – I

DIFFERENTIAL EQUATIONS OF FIRST ORDER AND THEIR APPLICATIONS: Formation of a differential equation – Differential equations of first order and first degree – Linear equation, Bernoulli's equation, Exact equation and equations reducible to exact form - Applications of first order differential equations: Orthogonal trajectories - Newton's law of cooling - Law of natural growth and decay.

UNIT – II

HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS AND THEIR APPLICATIONS: Linear differential equations of second and higher order with constant coefficients, Non-homogeneous term of the type $Q(x) = e^{ax}, \sin ax, \cos ax, x^n, e^{ax}V(x), x^nV(x)$ - Equations reducible to linear equations with constant coefficients – Cauchy's homogeneous linear equation – Legendre's linear equation - Method of variation of parameters - Applications of second order linear differential equations: $L-C-R$ Circuits - Simple Harmonic Motion.

UNIT – III

FUNCTIONS OF SINGLE AND SEVERAL VARIABLES, MULTIPLE INTEGRALS: Mean Value Theorems **–** Rolle's theorem - Lagrange's mean value theorem – Cauchy's mean value theorem - Generalized mean value theorem (all theorem statements and their verification). Functions of several variables – Jacobian - Functional dependence - Taylor's theorem for functions of two variables - Maxima and Minima of functions of two variables – Lagrange's method of undetermined multipliers. Multiple integrals - Double integrals - Change of variables in double integrals- Change of order of integration - Triple integrals.

UNIT – IV

LAPLACE TRANSFORM AND ITS APPLICATIONS TO ORDINARY DIFFERENTIAL EQUATIONS: Laplace transforms of elementary functions - First shifting theorem - Change of scale property - Multiplication by t^n - Division by t - Laplace transforms of derivatives and integrals - Second shifting theorem – Laplace transforms of some special functions: Unit step function – Dirac's delta function - Periodic function - Evaluation of integrals by Laplace transforms - Inverse Laplace transforms - Method of partial fractions - Other methods of finding Inverse Laplace transforms - Convolution theorem - Applications of Laplace transforms to ordinary differential equations.

UNIT-V

VECTOR CALCULUS: Scalar and vector point functions - Gradient, divergence, curl and their related properties - Solenoidal and irrotational vector point functions - Scalar potential function - Laplacian operator - Line integral - Work done - Surface integral - Volume integral - Vector integral theorems: Green's theorem in a plane - Stoke's theorem – Gauss's divergence theorem (all theorem statements and their verification).

TEXT BOOKS:

1. B S Grewal (2012), Higher Engineering Mathematics, 42nd Edition, New Delhi, Khanna Publishers.
2. B V Ramana (2010), Engineering Mathematics, New Delhi, Tata Mc Graw Hill Publishing Co. Ltd

REFERENCE BOOKS:

1. Kreyszig Ervin, Advanced Engineering Mathematics, 10th *Edition,* New Jersy, John *Wiley* & Sons
2. T K V Iyengar, B Krishna Gandhi & Others. (2011), Engineering Mathematics Vol - I, Tenth Revised Edition, New Delhi, S.Chand & Co. Ltd.
3. H K Dass, Er Rajnish Varma (2012), Higher Engineering Mathematics, Second Revised Edition, New Delhi, S Chand and Co. Ltd.

I Year B. Tech. IT - I Semester

PROBABILITY THEORY AND NUMERICAL METHODS

(Common to CSE / IT / EEE)

Course Code: **A2004**

L	T	P	C
3	1	-	4

UNIT-I

PROBABILITY: Sample space and events, probability- axioms of probability-some Elementary theorems-conditional probability-Bayes Theorem.

UNIT-II

RANDOM VARIABLES &DISTRIBUTIONS

Random variables. Discrete distribution – continuous distribution. Binomial distribution - Poisson distribution – Normal distribution-Related properties. Normal Approximation to binomial distribution.

UNIT-III

ALGEBRAIC AND TRANSCENDENTAL EQUATIONS, Interpolation:

Bisection method - Regula-falsi method - Iteration method - Newton-Raphson method.

Interpolation: Finite differences: Forward, Backward and Central differences - Other difference operators and relations between them - Differences of a polynomial – Missing terms - Newton's forward interpolation, Newton's backward interpolation, Interpolation with unequal intervals – Lagrange's interpolation.

UNIT-IV

NUMERICAL DIFFERENTIATION, INTEGRATION AND CURVE FITTING: Numerical differentiation: Derivatives using Newton's interpolation formulae. Numerical integration: Newton-cotes quadrature formula - Trapezoidal rule - Simpson's one-third rule - Simpson's three-eighth rule.

CURVE FITTING: Method of least squares - Fitting a straight line, second degree parabola and non-linear curves of the form by the method of least squares.

UNIT-V

NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: Single step methods: Taylor's series method - Euler's and modified Euler's Methods - Fourth order Runge-Kutta method for solving first order equations – Multistep method: Adam's bash forth Predictor and Corrector method.

TEXT BOOKS:

1. B S Grewal, (2012), Higher Engineering Mathematics, 42nd Edition, New Delhi, Khanna Publishers.
2. Richard Arnold Johnson, Irwin Miller,John E.Freund,(2011), Probability and Statistics for Engineers, Eighth Edition, New Delhi, Prentice Hall

REFERENCE BOOKS:

1. G S S Bhishma Rao (2011), *Probability and Statistics*, Fifth Edition, Hyderabad, Scitech Publications Pvt. Ltd.
2. N P Bali and N Ch Narayana Iyengar , (2004), *A Textbook of Engineering Mathematics*, Sixth Edition, New Delhi, Laxmi Publications.
3. S S Sastry (2005), *Introductory Methods of Numerical Analysis*, Fourth Edition, New Delhi, PHI Learning Pvt. Ltd.
4. Iyengar T.K.V., Krishna Gandhi B. & Others., (2013), Numerical Methods, Second Revised Edition, New Delhi, S.Chand & Co. Ltd.

I Year B. Tech. IT - I Semester

BASIC ELECTRICAL ENGINEERING

(Common to CSE / IT / ECE / EEE)

Course Code: **A2201**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO ELECTRICAL CIRCUITS: Concept of Circuit, R-L-C parameters, voltage and current sources, Independent and dependent sources, source transformation, voltage - current relationship for passive elements, Kirchhoff's laws, network reduction techniques, series, parallel and compound circuits.

UNIT - II

ANALYSIS OF ELECTRICAL CIRCUITS: Mesh analysis: mesh equations by inspection method, super mesh analysis, nodal analysis: nodal equations by inspection method, supernode analysis, star-to-delta or delta-to-star transformation.

NETWORK TOPOLOGY: Definitions, graph, tree, basic tieset and basic cutset matrices for planar networks duality & dual networks.

UNIT - III

SINGLE PHASE AC CIRCUITS: R.M.S, average values and form factor for different periodic wave forms, steady state analysis of R, L and C (in series, parallel and series parallel combinations) with sinusoidal excitation, concept of reactance, impedance, susceptance and admittance. Concepts of phase and phase difference.

POWER AND POWER FACTOR: Concept of power factor, real and reactive powers, J notation, complex and polar forms of representation, complex power.

UNIT - IV

NETWORK THEOREMS: Thevenin's, Norton's, Maximum Power Transfer, Superposition, Reciprocity, Millman's, Tellegen's, and Compensation theorems for DC and AC excitations.

UNIT – V

NETWORK PARAMETERS: Two port network parameters, Z, Y, ABCD, Inverse ABCD, hybrid parameters and Inverse hybrid and their relations.

TEXT BOOKS:

1. William H. Hayt, Jack E. Kemmerly, Steven M. Durbin (2006), *Engineering Circuits Analysis*, 7th Edition, Mc Graw Hill, New Delhi.
2. Joseph Edminister (2001), Electric Circuits, 6th Edition Schaum's Outlines, Tata Mc Graw Hill, New Delhi.

REFERENCE BOOKS:

1. Van Valkenburg, M. E. (1974), *Network Analysis*, 3rd Edition, Prentice Hall of India, New Delhi.
2. Wadhwa C. L (2009), *Electric Circuits Analysis,* New Age International Publications, New Delhi.
3. A. Sudhakar, Shyammohan S. Palli (2003), *Electrical Circuits*, 2nd Edition, Tata Mc Graw Hill, New Delhi.
4. A. Chakrabarthy (2005), Circuit Theory, 4th Edition, Dhanpat Rai & Sons Publications, New Delhi.

I Year B. Tech. IT - I Semester

COMPUTER PROGRAMMING

(Common to all Branches)

Course Code: **A2501**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO COMPUTERS: Introduction to computers, computer systems, computing environments, computer languages, creating and running programs, software development method, algorithms, pseudo code, flow charts, applying the software development method.

INTRODUCTION TO C LANGUAGE: Basic structures of C language, C tokens, data types and sizes, declaration of variables, assigning values

OPERATORS AND EXPRESSIONS: Statements, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bitwise operators, type conversions, expressions and evaluation, input and output statements, sample programs.

UNIT - II

CONTROL STATEMENTS: If and switch statements, while, do while and for statements, sample programs.

FUNCTIONS: Defining and accessing, passing arguments, function prototypes, library functions, static functions, user defined functions, recursive functions, variables and storage classes, scope rules, block structure, header files, C preprocessor, example C programs.

ARRAYS: Defining and processing, one dimensional and two dimensional arrays, initialization, passing arrays to a function, multi dimensional arrays, command line arguments.

UNIT - III

STRINGS: Defining and operations on strings, string variables declaration, reading, writing. Basics of functions, parameter passing, string handling functions.

POINTERS: Basic Concepts, pointer to pointer, passing pointers to a function, operations on pointers, pointer arithmetic, pointers and arrays, arrays of pointers, function pointers, dynamic memory allocation.

UNIT - IV

STRUCTURES AND UNIONS: Structure definition, initializing, assigning values, passing of structures as arguments, arrays of structures, pointers to structures, self reference to structures, unions, typedef, bit fields, sample programs.

UNIT - V

CONSOLE AND FILE I/O: File, types of files, file vs. console, file structure, file attributes, file operations, standard I/O, formatted I/O, sample programs.

TEXT BOOKS:

1. B. A. Fouruzan and R. F. Gilberg (2006), *Computer Science: A structured programming approach using C,* 3rd edition, Thomson Publications, New Delhi.
2. Yashawanth Kanethkar (2008), *Let us C*, 8th edition, Jones & Bartlett Publishers, India.

REFERENCE BOOKS:

1. Herbert Schildt (2000), *C: The Complete Reference*, 4th Edition, New Delhi, Osborne Mc Graw Hill.
2. B. W. Kerninghan, Dennis M. Ritche (1988), *The C Programming Language*, 2nd edition, Prentice Hall Software Series, India.
3. Stephen G.Kochan (2004), *Programming in C*, 3rd Edition, Pearson Education Private Limited.

I Year B. Tech. IT - I Semester

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

(Common to CSE / IT / EEE)

Course Code: **A2009**

L	T	P	C
-	-	3	2

The Language lab focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

SYLLABUS:

The following course content is prescribed for the English Language Laboratory sessions:

1. Introduction to phonetics
2. Sounds of English- vowels, diphthongs & consonants
3. Introduction to stress and intonation
4. Oral presentations- prepared
5. Oral Presentations- Extempore
6. Situational dialogues / role play
7. 'Just A Minute' sessions (JAM)
8. Information transfer
9. Telephoning skills
10. Describing objects, situations and people
11. Giving directions
12. Listening for specific information
13. Listening to record telephone conversations
14. Debate

SUGGESTED SOFTWARE:

- Cambridge advanced learners' English dictionary with cd.
- The Rosetta stone English library.
- Clarity pronunciation power – part I.
- Oxford advanced learner's compass, 7th Edition.
- Learning to speak English - 4 CDs.
- Vocabulary in use, Michael McCarthy, felicity o'den, Cambridge.
- Murphy's English grammar, Cambridge with CD.

REFERENCE BOOKS:

1. Suresh Kumar. E. & Sreehari P.A (2007), *Handbook for English Language Laboratories,* Cambridge University Press India Pvt. Ltd, New Delhi.
2. Mandal S. K (2006), *Effective Communication & Public Speaking*, Jaico Publishing House, New Delhi.
3. Grant Taylor (2004), *English Conversation Practice,* Tata McGraw Hill, New Delhi.
4. Balasubramanian .T (2000), *A text book of English Phonetics for Indian Student, Mac* Millan Publishers, India.
5. Kamalesh Sadanand, Susheela Punitha (2008), *Spoken English: A foundation Course: Parts 1 & 2,* New Delhi, Orient Longman Pvt. Ltd.

I Year B. Tech. IT - I Semester

COMPUTER PROGRAMMING LAB

(Common to all Branches)

Course Code: **A2502**

L	T	P	C
-	-	6	2

LIST OF EXPERIMENTS:

Week – 1 (Operators)

1. Write C programs for the following:
   a) Swapping of two numbers without using a third variable.
   b) Check whether the given number is odd or even using conditional operator.
   c) Read two integers and shift the first integer by two bits to the left and second integer by one bit to the right.

Week – 2 (if and switch statements)

2. Write C programs for the following:
   a) Check whether the input alphabet is a vowel or not.
   b) Find the roots of a quadratic equation.
   c) Perform basic arithmetic operations like addition, subtraction, multiplication, division and modulus of two numbers using switch-case statement. Numbers are assumed to be integers and will be entered by the user.

Week – 3 (Loops)

3. Write C programs for the following:
   a) Print Armstrong numbers between 1 to n where n value is entered by the user. Armstrong number is defined as the sum of cubes of individual digits of a number. e.g. $371 = 3^3 + 7^3 + 1^3$
   b) Generate the first n terms of the Fibonacci sequence.
   c) Calculate the following sum:
   Sum=1 + $x^2/2!$ + $X^4/4!$ + ---------- up to given 'n' terms.
   d) Generate all the prime numbers between 1 and n, where n value is supplied by the user.
   e) Find the GCD and LCM of two numbers. Numbers are assumed to be integers and will be entered by the user.

Week – 4 (Loops)

4. Write C programs for the following:
   a) Print first n lines of the Pascal's Triangle. Pascal's Triangle is a triangular array of the binomial coefficients.

```
                1
            1       1
        1       2       1
    1       3       3       1
```

   b) Print first n lines of Floyd's Triangle.

```
1
2   3
4   5   6
7   8   9   10
11  12  13  14  15
```

Week – 5 (Arrays)

5. Write C programs for the following:
   a) Find the largest and smallest number among a list of integers.
   b) Read a list of elements into an array 45, 14, 78, 36, 64, 9, 25, 99, 11 and find weather a particular element is present in the list or not using linear search.
   c) Read a list of elements into an array and print the reverse of the list.
   d) Read two matrices and find the addition and multiplication of two matrices.
   e) Find the transpose of a matrix.
   e.g. Given matrix

```
1  2  3
4  5  6
```

Transpose of the matrix:

```
1   4
2   5
3   6
```

Week – 6 (Functions)

6. Write C programs that uses both recursive and non-recursive functions:
   a) Find the sum of n natural numbers.
   b) Find the factorial of a given number.
   c) Find the N^{th} Fibonacci number.
   d) Find the reverse of a number.

Week – 7 (Strings)

7. Write C programs for the following:
   a) Check whether the given string is palindrome or not with and without using string functions.
   b) Insert a sub-string in to given main string from a given position.
   c) Find the frequency of a given character in a string.
   d) Delete n characters from a given position in given string.

Week – 8 (Pointers)

8. Write C programs for the following:
   a) Reverse a string using pointers.
   b) Read a list of elements into an array. Find the sum of array elements using pointers.
   c) Copy the elements of one array to another array using pointers.
   d) Read two strings and compare these two strings character by character. Display the similar characters found in both the strings and count the number of dissimilar characters.

Week – 9 (Structure and Union)

9. Write C programs for the following:
   a) Read the full name and date of birth of a person and display the same using nested structure.
   b) Create a Student structure containing name, rollno and grades as structure members. Display the name, rollno and grades of n students by using array of structures concept.
   c) Create a Book structure containing name, author and pages as structure members. Pass the address of structure variable to a user defined function and display the contents.
   d) Create a Result union and Result structure containing marks and grades as members. Find the size of union and number of bytes reserved for it.

Week – 10 (Enumerated Data Types, Typedef, Bit Fields, Pre-processor Directives)

10. Write C programs for the following:
   a) Create enumerated data type for 7 days of a week. Display their values in integer constants.
   b) Find the biggest number among two numbers using a parameterized macro.
   c) Create a student structure using typedef containing id, name and age as structure members. Declare a bit field of width 3 for age and display the student details.

Week – 11 (Command line arguments)

11. Write C programs for the following:
   a) Pass n number of arguments at the command line and display total number of arguments and their names.
   b) Add two numbers using command line arguments.

Week – 12 (Files)

12. Write C programs for the following:
   a) Copy the contents of one file to another.
   b) Merge the contents of two files and store it in a third file.
   c) Read name and marks of n number of students from user and store them in a file.

Week – 13 (Additional Programs)

13. Write C programs for the following:
   a) Find the 2's compliments of a binary number.
   b) Convert a Roman numeral to its decimal equivalent
   c) Count the number of lines, words and characters in a given string.
   d) Concatenate two given strings without using built-in function.
   e) Demonstration of dynamic memory allocation functions with example.

REFERENCE BOOKS:

1. Pradip Dey, Ghosh Manas (2009), *Programming in C,* Oxford University Press, USA.
2. E. Balaguruswamy (2009), *C and Data Structures,* 5th Edition, TMH publications, India.
3. M.K. Jain, S.R.K. Iyengar & R.K. Jain (2007), *Numerical Methods for Scientific and Engineering Computation,* 5th edition, New Age International Publishers, New Delhi.
4. Aitkinson, Han (2006), *Elementary Numerical Analysis*, 3rd Edition, John Wiley & Sons (Asia) Private Ltd., India.

I Year B. Tech. IT - I Semester

IT WORKSHOP

(Common to CSE / IT)

Course Code: **A2601**

L	T	P	C
-	-	3	2

PC Hardware

Week 1:

Task 1: Draw the block diagram of the CPU along with the configuration of each peripheral. Identify the peripherals of a computer, components in a CPU and its functions.

Task 2: practice to disassemble and assemble the components of a PC to working condition.

Week 2:

Task 3: Installation of operating systems like MS windows, LINUX and different packages on a PC.

Task 4: Practice hardware troubleshooting exercises related to various components of computer like monitor, drives, memory devices, printers etc. and software troubleshooting related to BIOS etc.

Week 3:

Task 4: Exposure to Basic commands in Linux General Purpose utilities like man,who,tty,clear,date,cal,passwd; File Handling utilities like pwd,mkdir,rmdir,cp,rm,mv,cat,cd,ls,ln; Filters like wc,cmp,diff,head,tail,sort.

NETWORKING AND NETWORK ADMINISTRATION

Week 4:

Task 5: Networking - Students should get to know about some of the Communication and Transmission devices, Network cabling, Features of Networking, Communication Protocols, Types of Network Topologies and Types of Networks.

Task 6: Network Administration –Holding & protecting Supervisor password, Protecting access to sensitive files, Allocation of user login, password and access rights, Control on unauthorized user activities, Day to Day management of user requirements,Vigilence over unauthorized programs, failed attempts to access, Steps to prevent hacking & wiretapping, Password control, Maintenance of Audit trail logs, Physical control on access to server & console.

Internet & World Wide Web

Week 5:

Task 6: Orientation & Connectivity Boot Camp and surfing the Web using Web Browsers: Students should get connected to their Local Area Network and access the Internet. In the process they should configure the TCP/IP setting and demonstrate how to access the websites and email. Students customize their web browsers using bookmarks, search toolbars and pop up blockers.

Task 7: Search Engines and Netiquette (Demonstration): Students should know about different search engines and their usage. A few topics would be given to the students for which they need to search on Google etc.

Week 6:

Task 8: Cyber Hygiene (Demonstration): Awareness of various threats on the internet. To install antivirus software and to configure their personal firewall and windows update on their computers.

Documentation

Week 7:

Task 9: Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007. Importance of LaTeX and MS office 2007. Give the details about LaTeX/MS word accessing, overview of toolbars, saving files and Using help and resources.

Weak 8:

Task 10: Using LaTeX/Word to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option and Mail merge in LaTeX/Word.

Task 11: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Presentation
LaTeX /MS Power Point
Week 9:
Task12: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Power point. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

Week 10:
Task 13: Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Excel
Week 11:
Task 14: Excel Orientation: The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the two tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.
Task 15: Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text.

Week 12:
Task 16 : Calculating GPA - .Features to be covered:- Cell Referencing, Formulae in excel – average, standard deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP, Sorting, Conditional formatting.

REFERENCE BOOKS:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken. Quamme. – CISCO Press, Pearson Education.
3. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft).

I Year B. Tech. IT - II Semester

MATHEMATICS – II

(Common to all Branches)

Course Code: **A2006**

L	T	P	C
3	1	-	4

UNIT – I

THEORY OF MATRICES: Real matrices: Symmetric, skew – symmetric and orthogonal matrices - Complex matrices: Hermitian, Skew - Hermitian and Unitary matrices - Elementary row and column transformations - Elementary matrix - Finding rank of a matrix by reducing to Echelon form and Normal form - Finding the inverse of a matrix using elementary row/column transformations (Gauss-Jordan method) - Consistency of system of linear equations (homogeneous and non- homogeneous) using the rank of a matrix - Solving $m \times n$ and $n \times n$ linear system of equations by Gauss elimination - Cayley-Hamilton Theorem (Statement and Verification) - Finding inverse and powers of a matrix by Cayley-Hamilton theorem.

UNIT – II

LINEAR TRANSFORMATIONS: Linear dependence and independence of vectors - Linear Transformation, Orthogonal Transformation - Eigen values and eigen vectors of a matrix - Properties of eigen values and eigen vectors of real and complex matrices - Diagonalization of a matrix.

Quadratic forms up to three variables - Rank, Index, Signature and Nature of quadratic form - Reduction of a quadratic form to canonical form using linear and orthogonal transformations.

UNIT – III

PARTIAL DIFFERENTIAL EQUATIONS: Formation of partial differential equation by elimination of arbitrary constants and arbitrary functions - Solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations - Equations reducible to standard forms - Method of separation of variables for second order equations.

UNIT – IV

FOURIER SERIES: Determination of Fourier coefficients - Fourier series in an arbitrary interval - Fourier series of even and odd functions - Half-range Fourier sine and cosine expansions.

UNIT – V

FOURIER TRANSFORMS: Fourier integral theorem (statement) - Fourier sine and cosine integrals - Fourier transforms - Fourier sine and cosine transforms - Properties - Inverse transforms - Finite Fourier transforms.

Z-TRANSFORMS: Definition - Some standard Z-transforms - Damping rule - Shifting rule - Multiplication by n - Initial and final value theorems - Inverse Z-transforms using partial fractions - Convolution theorem - Solution of difference equations by Z - transforms.

TEXT BOOKS:

1. B S Grewal (2012), *Higher Engineering Mathematics*, 42nd Edition, New Delhi, Khanna Publishers.
2. B V Ramana (2010), *Engineering Mathematics*, New Delhi, Tata Mc Graw Hill Publishing Co. Ltd

REFERENCE BOOKS:

1. Ervin Kreyszig, *Advanced Engineering Mathematics,* 10th *Edition,* New Jersy, John *Wiley* & Sons.
2. T K V Iyengar, B Krishna Gandhi & Others. (2011), *Mathematical Methods*, Tenth Revised Edition, New Delhi, S.Chand & Co. Ltd.
3. H K Dass, Er Rajnish Varma (2012), *Higher Engineering Mathematics*, Second Revised Edition, New Delhi, S.Chand & Co. Ltd.

ENGINEERING PHYSICS

(Common to CSE / IT / EEE)

Course Code: **A2002**

L	T	P	C
4	-	-	4

UNIT – I

INTRODUCTION TO CRYSTALLOGRAPHY: Space lattice, Unit cell, lattice parameters, Atomic radius, co-ordination number and packing factor of SC, BCC, FCC, and diamond, Miller indices, Crystal planes and directions, Interplanar spacing of orthogonal crystal systems.

X-RAY DIFFRACTION: Basic principles of X-ray diffraction, Bragg's law, Laue method, Rotating Crystal Method, Powder method, applications of X- ray diffraction.

UNIT – II

PRINCIPLES OF QUANTUM MECHANICS: Waves and particles, De Broglie hypothesis, matter waves, Davisson and Germer experiment, G. P. Thomson experiment, Schrödinger's time independent wave equation, Application of Schrodinger equation (particle in one dimensional potential box).

SEMICONDUCTOR PHYSICS: Intrinsic and Extrinsic Semiconductors, p-n junction diode, Forward and reverse bias, V-I characteristics, Fermi level in Intrinsic and Extrinsic semiconductors (qualitative), Applications of Semiconductors (LED).

UNIT – III

NANO SCIENCE: Origin of Nano science, Nano scale, surface to volume ratio, Bottom-up and Top-down approaches; Synthesis: Sol-gel, Chemical vapour deposition, physical vapour deposition, pulsed laser vapour deposition methods; Applications of Nanomaterials.

DIELECTRIC PROPERTIES: Electric dipole moment, dielectric constant, Types of polarization (qualitative), Local Field, Clausius – Mossotti Equation, Piezoelectricity and Ferroelectricity and their applications.

UNIT – IV

MAGNETIC PROPERTIES: Magnetic moment, classification of magnetic materials, Weiss theory of ferromagnetism, hysteresis curve, soft and hard magnetic materials and their applications.

SUPERCONDUCTORS: Meissner effect, BCS Theory, Type-I and Type-II Superconductors, High temperature Superconductors, applications of superconductors.

UNIT – V

LASERS: Characteristics of lasers, spontaneous and stimulated emission of radiation, population inversion, Einstein's coefficients, Pumping mechanisms, Ruby laser, Helium-Neon laser, semiconductor diode laser, applications of lasers.

FIBER OPTICS: Principle of optical fiber, acceptance angle, Numerical aperture, types of optical fibers, attenuation of signal in optical fibers, Functioning of Optical Fiber communication system, applications of optical fibers.

TEXT BOOKS:

1. Pillai, S.O., 'Engineering Physics', New Age International, 2007.
2. Arumugam, M, 'Engineering Physics', Anuradha Publishers, 2005.

REFERENCE BOOKS:

1. Rajendran, V and Marikani A, 'Engineering Physics' Tata Mc Graw Hill Publications Ltd, III Edition, 2004
2. C. Kittel (2009), 'Introduction to Solid State Physics', 8th edition, Wiley Eastern Publications, India.
3. P.Sarah and M. Geetha (2012), 'Engineering Physics and Engineering Chemistry', VGS Booklinks, Hyderabad
4. M. Ratner, D. Ratner (2003), 'Nanotechnology', Pearson Edition, India.
5. P. Sarah (2008), 'Lasers & Optical Fiber communications', IK International (P) Ltd, New Delhi.

I Year B. Tech. IT - II Semester

ENGINEERING CHEMISTRY

(Common to CSE / IT / EEE)

Course Code: **A2003**

L	T	P	C
4	-	-	4

UNIT-I

ELECTROCHEMISTRY: Introduction, Conductance-Specific, Equivalent and Molar conductance, effect of dilution on electrolytic conductance. EMF: Galvanic Cells, Nernst equation, numerical problems. Concept of concentration cells, electro chemical series-applications.

BATTERIES: Primary and secondary cells, (Lechlanche cell, Lead-Acid cell, Ni- Cd cell, Lithium cells). Applications of batteries, Fuel cells: Hydrogen – Oxygen fuel cell, advantages of fuel cells.

CORROSION AND ITS CONTROL: Introduction, causes of corrosion, theories of corrosion – Chemical, Electrochemical corrosion. Corrosion control methods – Cathodic protection, sacrificial anode, impressed current cathode. Surface coatings – electroplating, metal cladding. Galvanizing.

UNIT-II

WATER TREATMENT: Introduction to Hardness, causes, expression of hardness, units. Types of hardness, numerical problems. Treatment of water: Internal treatment, types & External treatment: Zeolite process, Ion exchange process and Lime- soda process. Numerical problems on lime- soda and Zeolite process. Treatment of brackish water: Reverse osmosis and Electro dialysis.

UNIT – III

ENGINEERING MATERIALS:

HIGH POLYMERS: Introduction, Types of Polymerization. Plastics: Thermoplastic resins & Thermosetting resins, preparation, properties and engineering applications of plastics: polyethylene, Poly vinyl chloride, Teflon, Nylon. Rubbers: Natural rubber and vulcanization. Synthetic rubbers: Buna-S, Buna-N. Fibers: Polyester- applications. Conducting Polymers: Classification, doping and applications.

MATERIAL CHEMISTRY: Cement- Composition and manufacture of Port land Cement. Lubricants: Criteria of a good lubricant, classification. Refractory: Criteria of a good refractory, classification. Insulators & conductors: Classification of insulators. Characteristics of thermal & electrical insulators, Superconductors: Applications of Superconductors.

UNIT-IV

ENERGY SOURCES: Fuels: Classification -Conventional fuels: solid, liquid, gaseous fuels- comparison. Solid fuels: Coal- analysis- proximate and ultimate analysis, significance. Liquid fuels: Petroleum –origin, refining of petroleum. Synthetic petrol: Fischer Tropsch's and Bergius process. Gaseous fuels: Natural gas, Flue gas: Analysis of Flue gas by Orsat's method. Combustion: problems (calculation of amount and volume of oxygen for combustion).

UNIT – V

PHASE RULE: Gibb's phase rule expression, terms involved: Phase, Component and Degree of Freedom. Significance and limitations of phase rule. Phase diagrams: One component system- Water system. Two component system- Silver- lead system.

SURFACE CHEMISTRY: Adsorption:Types of adsorption. Adsorption isotherm: Langmuir adsorption isotherm, applications of adsorption. Colloid: Classification of colloids. Properties of colloid: Electrical & optical properties. Applications of colloids: Natural and industrial applications.
Nanomaterials: Introduction, preparation and applications of nanomaterial.

TEXT BOOK:

1. S.S Dara & Mukkanti, (2006). Engineering Chemistry, S. Chand & Co. New Delhi.

REFERENCE BOOKS:

1. P. C. Jain & Monica Jain, (2008). Engineering Chemistry, Dhanpatrai Publishing Company.
2. K. N. Mishra, R.P Mani &B. Rama Devi(2009). Chemistry of Engineering Materials, CENGAGE.
3. J. C. Kuriacase & J Raja ram (2004), Engineering Chemistry, Tata McGraw Hills Co. New Delhi.

I Year B. Tech. IT - II Semester

ELECTRONIC DEVICES AND CIRCUITS

(Common to: CSE / IT)

Course Code: **A2402**

L	T	P	C
3	1	-	4

UNIT – I

SEMICONDUCTOR DIODE CHARACTERISTICS: Introduction to semiconductors, Operation of PN junction - forward bias and reverse bias, diode current equation (qualitative treatment), volt-ampere (V-I) characteristics, ideal versus practical diode, static and dynamic resistances, diode equivalent circuits, break down mechanisms in diodes, Zener diode.

RECTIFIERS AND FILTERS: Block diagram of regulated power supply, half-wave rectifier, full-wave rectifier, bridge Rectifier, filters (qualitative treatment), Zener diode as a voltage regulator.

UNIT - II

BIPOLAR JUNCTION TRANSISTOR (BJT): BJT construction, operation, symbol, transistor current components, input & output characteristics of a transistor in CB, CE and CC configurations.

FIELD EFFECT TRANSISTOR: Junction field effect transistor (construction, principle of operation, symbol), volt-ampere characteristics, MOSFET (construction, principle of operation, symbol), characteristics in enhancement and depletion modes..

UNIT – III

BJT BIASING: Need for biasing, operating point, load line analysis, biasing and stabilization techniques: fixed bias, collector to base bias, self-bias, Stabilization against variations in I_{CO}, V_{BE} and β, bias compensation techniques, thermal runaway, heat sink and thermal stability.

FET BIASING: Biasing techniques: Fixed bias, Self-bias and Voltage divider bias.

UNIT – IV

BJT AMPLIFIERS: BJT h-parameter model, analysis of transistor amplifier using h-parameter model, CE, CB and CC amplifiers, comparison of CB, CE and CC configurations, simplified h-parameter model, comparison of transistor amplifier configurations.

UNIT – V

FEEDBACK AMPLIFIERS: Concept of feedback, classification of feedback amplifiers, general characteristics of negative feedback amplifiers, effect of negative feedback on input and output resistances.

OSCILLATORS: Condition for oscillations, RC Phase shift oscillator with transistor, Wein bridge oscillator, Hartley and Colpitts oscillator.

TEXT BOOKS:

1. J. Millman, Christos C. Halkias (2008), Electronic Devices and Circuits, Tata McGraw Hill, New Delhi.
2. R. L. Boylestad and Louis Nashelsky (2006), Electronic Devices and Circuits, 9th edition, Prentice Hall of India, New Delhi.

REFERENCE BOOKS:

1. Rober T. Paynter (2003), Introduction to Electronic Devices and Circuits, 6th edition, Pearson Education, New Delhi, India.
2. S. Salivahana, N. Suresh Kumar, A. Vallavaraj (2008), Electronic Devices and Circuits, 2nd edition, Tata McGraw Hill, New Delhi.

I Year B. Tech. IT - II Semester

DATA STRUCTURES THROUGH C

(Common to CSE / IT / ECE / EEE)

Course Code: **A2503**

L	T	P	C
3	1	-	4

UNIT - I

RECURSION AND LINEAR SEARCH: Preliminaries of algorithm, algorithm analysis and complexity. Recursion definition, design methodology and implementation of recursive algorithms, linear and binary recursion, recursive algorithms for factorial function, GCD computation, Fibonacci sequence, Towers of Hanoi, tail recursion. List searches using linear search, binary search, Fibonacci search, analyzing search algorithms.

UNIT - II

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.

UNIT - III

STACKS: Basic stack operations, representation of a stack using arrays, *Stack Applications*: Reversing list, factorial calculation, in-fix- to postfix transformation, evaluating arithmetic expressions.

QUEUES: Basic queues operations, representation of a queue using array, implementation of Queue operations using Stack, applications of Queues-Round Robin Algorithm, Enqueue, Dequeue, Circular queues, Priority queues.

UNIT - IV

LINKED LISTS: Introduction, single linked list, representation of a linked list in memory, operations on a single linked list, merging two single linked lists into one list, reversing a single linked list, applications of single linked list to represent polynomial expressions and sparse matrix manipulation, advantages and disadvantages of single linked list, circular linked list, double linked list.

UNIT - V

TREES: Basic tree concepts, *Binary Trees:* Properties, representation of binary trees using arrays and linked lists, operations on a binary tree, binary tree traversals, creation of binary tree from in-order and pre (post) order traversals, tree travels using stack, threaded binary trees.

GRAPHS: Basic concepts, *Representations of Graphs:* Using Linked list and adjacency matrix, graph algorithms, graph traversals (BFS & DFS).

TEXT BOOKS:

1. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan (2008), *Fundamentals of Data Structure in C*, 2nd Edition, University Press, India.
2. Richard F. Gilberg, Behrouz A. Forouzan (2005), *Data Structures: A Pseudo code approach with C*, 2nd Edition, Thomson, India.

REFERENCE BOOKS:

1. Seymour, Lipschutz (2005), *Data Structures*, Schaum's Outlines Series, Tata McGraw-Hill, India.
2. Debasis, Samanta (2009), *Classic Data Structures*, 2nd Edition, Prentice Hall of India, India.
3. G. A. V. Pai (2008), *Data Structures and Algorithms: Concepts, Techniques and Applications*, Tata McGraw-Hill Education, India.
4. A. M. Tanenbaum, Y. Langsam, M. J. Augustein (1991), *Data Structures using C*, Prentice Hall of India, New Delhi, India.

I Year B. Tech. IT - II Semester

ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LAB

(Common to CSE / IT / EEE)

Course Code: **A2008**

L	T	P	C
-	-	3	2

PHYSICS LAB:

1. Determination of Rigidity modulus (η) of the material of the given wire using a Torsional Pendulum.
2. Determination of Frequency (n) of an AC supply using Sonometer.
3. Study of V-I characteristics of light emitting diode and determination of the Threshold voltage of LED.
4. Study of exponential decay of charge in a R.C. Circuit and determination of time constant of R.C circuit.
5. Determination of numerical aperture of a given optical fiber.
6. Determination of wavelength of a given source of laser light using a plane transmission grating by normal incidence method.
7. Determination of angular divergence of the laser beam.
8. Determination of Dispersive power of material of a prism.

CHEMISTRY LAB:

1. **TITRIMETRY:** Estimation of hardness of water by EDTA method (or) Estimation of calcium in limestone by permanganometry.

INSTRUMENTAL METHODS:

2. **CONDUCTOMETRY:** Conductometric titration of strong acid vs strong base (or) Conductometric titration of mixture of acids vs strong base.

3. **POTENTIOMETRY:** Titration of strong acid vs strong base by potentiometry (or) Titration of weak acid vs strong base by potentiometry.

PHYSICAL PROPERTIES:

4. Determination of viscosity of sample oil by redwood / ostwald's viscometer.

5. Determination surface tension of lubricants.

6. **IDENTIFICATION AND PREPARATIONS:** preparation of organic compounds: aspirin (or) benzimidazole.

7. **DEMONSTRATION EXPERIMENTS (ANY ONE OF THE FOLLOWING)**:
   a. Preparation of thiokol rubber
   b. Adsorption on charcoal

TEXT BOOKS:

1. Practical Engineering Physics by Dr. P Sarah, Ms. S Shashi devi, Mr. C. Venkatasubbaiah.
2. Practical Engineering Chemistry by K Mukkanti et.al, B S Publications, Hyderabad.
3. Inorganic quantitative analysis, Vogel.

REFERENCE BOOKS:

1. Text Book of engineering chemistry by R. N. Goyal and Harrmendra Goel.
2. A text book on experiments and calculation engineering chemistry by S.S. Dara.
3. Instrumental methods of chemical analysis by Chatwal, Anand, Himalaya Publications.

I Year B. Tech. IT - II Semester

ELECTRONIC DEVICES AND CIRCUITS LAB

(Common to CSE / IT)

Course Code: **A2405**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

PART - A:

ELECTRONIC WORKSHOP PRACTICE

1. Identification, Specifications, Testing of R, L, C Components (Color Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Relays, Bread Boards, PCB's.
2. Identification, Specifications and Testing of Active Devices: Diodes, BJTs, JFETs, MOSFETs, Power Transistors, LED's, LCD's, SCR, UJT.
3. Study and operation of
    - Multimeters (Analog and Digital)
    - Function Generator
    - Regulated Power Supply (RPS)
    - CRO
4. Soldering Practice.

PART - B:

1. Forward and Reverse Bias Characteristics of PN junction diode.
2. Zener Diode Characteristics and Zener diode as voltage regulator.
3. Half wave rectifier with and without filters.
4. Full wave rectifier with and without filters.
5. Input & output characteristics of transistor in CB configuration.
6. Input & output characteristics of transistor in CE configuration.
7. Input & output characteristics of transistor in CC configuration.
8. Drain and Transfer characteristics of JFET.
9. Voltage divider bias using BJT.
10. UJT characteristics.
11. SCR characteristics.

I Year B. Tech. IT - II Semester

DATA STRUCTURES THROUGH C LAB

(Common to CSE / IT / ECE / EEE)

Course Code: **A2504**

L	T	P	C
-	-	6	2

LIST OF EXPERIMENTS:

Week- 1: (Recursion function)

a) Write recursive program which computes the n_{th} Fibonacci number, for appropriate values of n.
b) Write recursive program to find X^y, where y can be either negative or positive.
c) Write recursive program to calculate the sum of the individual digits of N digit number.

Week-2: (Recursion function)

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 C program for Towers of Hanoi: N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.

Week-3: (Searching Technique)

a) Write C programs that use both recursive and non-recursive functions to perform the searching operations for a key value in a given list of integers by using linear search technique.
b) Write C programs that use both recursive and non-recursive functions to perform the searching operations for a key value in a given list of integers by using binary search technique.
c) A person has registered for voter id , he received a voter number and he need to check whether it exist in the voter or not. Use a binary searching in a recursive way to find whether the voter number exist in the list or not.
d) Use linear search technique to search for a key value in a given list of characters and print the message found or not.

Week-4: (Sorting Technique)

a) Write C programs that implement Bubble sort, to sort a given list of integers in ascending order
b) Write C programs that implement Quick sort, to sort a given list of integers in ascending order.
c) A class contains 50 students who acquired marks in 10 subjects write a program to display top 10 students roll numbers and marks in sorted order by using bubble sorting technique

Week-5: (Sorting Technique)

a) Write C programs that implement Insertion sort, to sort a given list of integers in ascending order
b) Write C programs that implement Merge sort, to sort a given list of integers in ascending order
c) Write C programs that implement radix sort, to sort a given list of integers in ascending order

Week- 6: (Stack)

a) Write C programs to implement Stack operations using linked list.
b) Write C programs to implement Stack operations using array.
c) Write a function called copystack that copies those contents of one stack into another. The algorithm passes two stacks, the source stack and the destination stack. The order of the stack must be identical. (Hint: Use a temporary stack to preserve the order).

Week-7: (Stack)

a) Write a C program that uses Stack operations to convert infix expression into postfix expression.
b) Write a C program that uses Stack operations for evaluating the postfix expression.

Week-8: (Queue)

a) Write C programs to implement Queue operations using linked list.
b) Write C programs to implement Queue operations using array.

Week- 9: (Linked list)

a) Write a C program that uses functions to perform the following operations on single linked list.
(i) Creation (ii) insertion (iii) deletion (iv) traversal
b) Write a C program to reverse elements of a single linked list.

Week-10: (Linked list)

a) Write a C program to perform adding two large integers which are represented in linked list fashion.
b) Write a C program to store a polynomial expression in memory using linked list

Week-11: (Linked list)

a) Write a C program that uses functions to perform the following operations on double linked list.
(i) Creation (ii) insertion (iii) deletion (iv) traversal in both ways.
b) Write a C program to representation the given sparse matrix using linked list

Week-12: (Trees)

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, in-order and post-order
c) Write a C program to search the given node is available or not in the binary tree by using in-order traversal

Week-13: (Additional Programs)

a) Use linear search technique to search for a key value in a given list of characters and print the message found or not
b) Consider the motor racing game in which there are 7 participants. Out of 7, one quits the race due to bad vehicle condition. Others completed the race and their scores are as follows: p1 (56 points), p2 (96 points),p3 (40 points),p4 (89 points), p5 (66 points), p6(22 points).Now write a program for sorting the positions of players in ascending order based on points scored using merge sort and print the highest score.
c) Write C programs that implement heap sort, to sort a given list of integers in ascending order
d) Write a C program that uses functions to perform the following operations on Circular linked list.
(i) Creation (ii) insertion (iii) deletion (iv) traversal in both ways
e) Write a non recursive C program, for traversing a binary tree in preorder, in-order and post-order.

REFERENCE BOOKS:

1. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan (2008), Fundamentals of Data Structure in C, 2nd Edition, University Press, India.
2. Richard F. Gilberg, Behrouz A. Forouzan (2005), Data Structures: A Pseudo code approach with C, 2nd Edition, Thomson, India.

II Year B. Tech. IT - III Semester

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common to CSE / IT / CE)

Course Code: A2012

L	T	P	C
4	-	-	4

UNIT - I

MATHEMATICAL LOGIC: Statements and Notations, Connectives, Statement Formulas and Truth Tables, Well- formed formulas, Tautologies, Equivalence of Formulas, *Normal Forms,* Rules of Inference, Consistency of Premises and Indirect Method of Proof

PREDICATES: The Predicate calculus, Variables and Quantifiers, Free and Bound Variables, Inference theory of predicate calculus

UNIT - II

RELATIONS AND ORDERING: Relations, Properties of Binary Relations in a Set, Equivalence Relations, Compatibility Relations, and Partial Ordering, Partial Ordered Set – Representation and Associated Terminology.

FUNCTIONS: Definition and Introduction, Composition of Functions, Inverse Functions, Recursive Functions.

UNIT - III

ALGEBRAIC STRUCTURES: Algebraic Systems: Examples and General Properties. Semi groups and Monoids. Groups: Definitions and Examples, Subgroups and Homomorphisms.

LATTICES: Lattices as Partially Ordered Sets - Definition and Examples, Properties of Lattices, Lattices as Algebraic Systems, Sub lattices, Direct Product and Homomorphism, Some Special Lattices.

UNIT - IV

ELEMENTARY COMBINATORICS: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with Repetitions, Enumerating Permutations with Constrained Repetitions, Binomial Coefficients, The Binomial and Multinomial Theorems, The Principle of Inclusion-Exclusion.

UNIT - V

RECURRENCE RELATIONS: Generating Functions of Sequences, Calculating Coefficients of Generating Functions, Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, The Method of Characteristic Roots, Solutions of Inhomogeneous Recurrence Relations.

GRAPH THEORY : Representation of Graph, Planar graphs, Isomorphism and Sub graphs, Euler circuits, Hamiltonian graphs, Chromatic Numbers

TEXT BOOKS:

1. J. P. Trembly, R. Manohar (1997), *Discrete Mathematical Structures with Applications to Computer Science*, Tata McGraw Hill, India.
2. Joe L. Mott, Abraham Kandel, Theodore P. Baker (2011), *Discrete Mathematics for Computer Scientists and Mathematicians*, 2nd edition, Prentice Hall of India Learning Private Limited, New Delhi, India.

REFERENCE BOOKS:

1. Kenneth H. Rosen (2007), *Discrete Mathematics and its Applications*, 6th edition, Tata McGraw Hill, India.
2. C.L. Liu, D.P. Mohapatra (2008), *Elements of Discrete Mathematics*, 3rd edition, McGraw Hill, India.
3. Ralph P. Grimaldi, B.V.Ramana (2006), *Discrete and Combinatorial Mathematics - An Applied Introduction*, 5th Edition, Pearson Education, India.
4. D.S Malik, M. K Sen (2004), *Discrete Mathematical Structures: Theory and Applications*, Thomson Course Technology, India.

II Year B. Tech. IT - III Semester

DISCREETE MATHEMATICAL STRUCTURES

(Common to CSE / IT)

Course Code: A2505

L	T	P	C
3	1	-	4

UNIT - I

MATHEMATICAL LOGIC: Statements and Notations, Connectives, Statement Formulas and Truth Tables, Well- formed formulas, Tautologies, Equivalence of Formulas, *Normal Forms,* Rules of Inference, Consistency of Premises and Indirect Method of Proof

PREDICATES: The Predicate calculus, Variables and Quantifiers, Free and Bound Variables, Inference theory of predicate calculus

UNIT - II

RELATIONS AND ORDERING: Relations, Properties of Binary Relations in a Set, Equivalence Relations, Compatibility Relations, and Partial Ordering, Partial Ordered Set – Representation and Associated Terminology.

FUNCTIONS: Definition and Introduction, Composition of Functions, Inverse Functions, Recursive Functions.

UNIT - III

ALGEBRAIC STRUCTURES: Algebraic Systems: Examples and General Properties. Semi groups and Monoids. Groups: Definitions and Examples, Subgroups and Homomorphisms.

LATTICES: Lattices as Partially Ordered Sets - Definition and Examples, Properties of Lattices, Lattices as Algebraic Systems, Sub lattices, Direct Product and Homomorphism, Some Special Lattices.

UNIT - IV

ELEMENTARY COMBINATORICS: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with Repetitions, Enumerating Permutations with Constrained Repetitions, Binomial Coefficients, The Binomial and Multinomial Theorems, The Principle of Inclusion-Exclusion.

UNIT - V

RECURRENCE RELATIONS: Generating Functions of Sequences, Calculating Coefficients of Generating Functions, Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, The Method of Characteristic Roots, Solutions of Inhomogeneous Recurrence Relations.

GRAPH THEORY : Representation of Graph, Planar graphs, Isomorphism and Sub graphs, Euler circuits, Hamiltonian graphs, Chromatic Numbers

TEXT BOOKS:

1. J. P. Trembly, R. Manohar (1997), *Discrete Mathematical Structures with Applications to Computer Science*, Tata McGraw Hill, India.
2. Joe L. Mott, Abraham Kandel, Theodore P. Baker (2011), *Discrete Mathematics for Computer Scientists and Mathematicians*, 2nd edition, Prentice Hall of India Learning Private Limited, New Delhi, India.

REFERENCE BOOKS:

1. Kenneth H. Rosen (2007), *Discrete Mathematics and its Applications*, 6th edition, Tata McGraw Hill, India.
2. C.L. Liu, D.P. Mohapatra (2008), *Elements of Discrete Mathematics*, 3rd edition, McGraw Hill, India.
3. Ralph P. Grimaldi, B.V.Ramana (2006), *Discrete and Combinatorial Mathematics - An Applied Introduction*, 5th Edition, Pearson Education, India.
4. D.S Malik, M. K Sen (2004), *Discrete Mathematical Structures: Theory and Applications*, Thomson Course Technology, India.

DIGITAL LOGIC DESIGN

(Common to CSE / IT / ECE / EEE)

Course Code: A2406

L	T	P	C
3	1	-	4

UNIT - I

DIGITAL SYSTEMS AND BINARY NUMBERS: Digital systems, binary numbers, number base conversions, octal and hexadecimal numbers, complements, signed binary numbers, binary codes.

BOOLEAN ALGEBRA AND LOGIC GATES: Basic definitions, axiomatic definition of Boolean algebra, basic theorems and properties of Boolean algebra, Boolean functions, canonical and standard forms, other logic operations, digital logic gates.

UNIT - II

GATE LEVEL MINIMIZATION: The k-map method, four-variable map, five-variable map, sum of products and product of sums simplification, don't-care conditions, NAND and NOR implementation, AND-OR-INVERT, OR-AND-INVERT implementations, exclusive - OR function, the tabulation (Quine - Mccluskey) technique, determination and selection of Prime Implicants.

UNIT - III

COMBINATIONAL LOGIC: Combinational circuits, analysis procedure, design procedure, binary adder, binary subtractor, BCD adder, binary multiplier, magnitude comparator, decoders, encoders, multiplexers.

SEQUENTIAL LOGIC: Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples) latches, flip-flops, analysis of clocked sequential circuits, State reduction and assignment, design procedure.

UNIT - IV

REGISTERS AND COUNTERS: Registers, shift registers, ripple counters, synchronous counters, counters with unused states, ring counter, Johnson counter, LFSR counter.

MEMORY AND PROGRAMMABLE LOGIC: Introduction**,** Random access memory, memory decoding, error detection and correction, read only memory, programmable logic array, programmable array logic, sequential programmable devices.

UNIT - V

FINITE STATE MACHINE (FSM): Finite state machine-capabilities and limitations, Mealy and Moore models minimization of completely specified sequential machines, Partition techniques, incompletely specified sequential machines using merger table.

ALGORITHMIC STATE MACHINE (ASM): Salient features of the ASM chart-Simple examples-System design using data path and control subsystems-control implementations-examples of Weighing machine and Binary multiplier.

TEXT BOOKS:

1. M. Morris Mano, Michael D. Ciletti (2008), *Digital Design*, 4th Edition, Pearson Education Inc, India.
2. Charles H. Roth (2004), *Fundamentals of Logic Design*, 5th Edition, Thomson, India.

REFERENCE BOOKS:

1. Zvi. Kohavi (2004), *Switching and Finite Automata Theory*, Tata McGraw Hill, India.
2. C. V. S. Rao (2009), *Switching and Logic Design*, 3rd Edition, Pearson Education, India.
3. Donald D. Givone (2002), *Digital Principles and Design*, Tata McGraw Hill, India.

II Year B. Tech. IT - III Semester

OPERATING SYSTEMS

(Common to CSE / IT)

Course Code: A2506

L	T	P	C
-	4	-	-

UNIT - I

OPERATING SYSTEMS OVERVIEW: Introduction, operating system operations, process management, memory management, storage management, protection and security, distributed systems, special purpose systems.

OPERATING SYSTEMS STRUCTURES: Operating system services and systems calls, system programs, operating system structure, operating systems generations, Different PC and Mobile Operating system characteristics.

UNIT - II

PROCESS MANAGEMENT: Process concepts, process state, process control block, scheduling queues, process scheduling, multithreaded programming.

CONCURRENCY AND SYNCHRONIZATION: Process synchronization, critical section problem, Peterson's solution, synchronization hardware, semaphores, classic problems of synchronization, readers and writers problem, dining philosopher's problem, monitors.

UNIT - III

DEADLOCKS: System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock banker's algorithm.

MEMORY MANAGEMENT: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement algorithms, allocation of frames, thrashing.

UNIT - IV

FILE SYSTEM: Concept of a file, access methods, directory structure, file system mounting, file sharing, protection. File system implementation: file system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance.

I/O SYSTEM: Mass storage structure - overview of mass storage structure, disk structure, disk attachment, disk scheduling algorithms, swap space management, stable storage implementation, tertiary storage structure. **I/O:** Hardware, application I/O interface.

UNIT - V

PROTECTION: Goals of protection, principles of protection, domain of protection access matrix, implementation of access matrix, access control, revocation of access rights.

SECURITY: The security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, fire walling to protect systems.

TEXT BOOK:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2006), *Operating System Principles*, 7th edition, Wiley India Private Limited, New Delhi.

REFERENCE BOOKS:

1. Stallings (2006), *Operating Systems*, Internals and Design Principles, 5th edition, Pearson Education, India.
2. Andrew S. Tanenbaum (2007), *Modern Operating Systems*, 2nd edition, Prentice Hall of India, India.
3. Deitel & Deitel (2008), *Operating systems*, 3rd edition, Pearson Education, India.
4. Dhamdhere (2008), *Operating Systems*, Second Edition, Tata Mc graw Hill, New Delhi.

II Year B. Tech. IT - III Semester

COMPUTER ARCHITECTURE AND ORGANIZATION

Course Code: A2510

L	T	P	C
3	1	-	4

Unit – I

STRUCTURE OF COMPUTERS: Computer Functional units, Von-Neumann architecture, Bus structures, Basic Operational Concepts, Software, Performance, Data representation(Fixed and Floating point), Error detecting codes.

REGISTER TRANSFER AND MICRO-OPERATIONS: Register transfer language, Register transfer, Bus and memory transfers, Arithmetic micro-operations, Logic micro-operations, Shift micro-operations, and Arithmetic logic shift unit.

UNIT - II

BASIC COMPUTER ORGANIZATION AND DESIGN: Instruction codes, Computer registers, Computer instructions, Instruction cycle, Timing and Control, Memory-reference instructions, Register-reference instructions, Input-Output and interrupt. Central Processing Unit: Stack organization, Instruction formats, Addressing modes, Data transfer and manipulation, Program Control, Reduced Instruction Set Computer (RISC).

UNIT - III

MICRO-PROGRAMMED CONTROL: Control memory, Address sequencing, Micro-Program Example, design of control unit.

COMPUTER ARITHMETIC: Addition and Subtraction, Multiplication and Division algorithms, Floating-point arithmetic operation, Decimal arithmetic unit, Decimal arithmetic operations.

UNIT - IV

THE MEMORY SYSTEM: Basic concepts, Semiconductor RAM types of Read Only Memory (ROM), Cache memory, Performance considerations, Direct Memory Access (DMA).

Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline Vector Processing, Array Processors

UNIT - V

MULTIPROCESSORS: Characteristics of multiprocessors, Interconnection structures, Inter processor arbitration, Inter processor communication and Synchronization, Cache coherence, Shared memory multiprocessors.

TEXT BOOKS:

1. M. Moris Mano (2006), Computer Organization and Architecture, 3rd edition, Pearson/PHI, India.
2. Caarl Hamacher, Zvonks Vrnesic, SafeaZaky (2002), Computer Organization, 5th edition, McGraw Hill, New Delhi, India.

REFERENCE BOOKS:

1. Williams Stallings (2010), Computer Organization and Architecture – Design for performance, 8th edition, Prentice Hall, New Jersey.
2. Andrew S. Tanenbaum (2006), Structured Computer Organization, 5th edition, Pearson Education Inc, New Jersey.
3. Sivarama P. Dandamidi (2003), Fundomentals of Computer Organization and Design, Springer INT. Edition, USA.
4. John P. Hayes (1998), Computer Architecture and Organization, 3rd edition, Tata McGraw Hill, New Delhi, India.

II Year B. Tech. IT - III Semester

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

(Common to CSE / IT)

Course Code: **A2508**

L	T	P	C
4	-	-	4

UNIT - I

OBJECT ORIENTED THINKING: Need for object oriented programming paradigm, a way of viewing world agents and Communities, messages, methods, responsibilities, Classes and Instances, Class Hierarchies-Inheritance ,Method Binding, Overriding and Exceptions.

JAVA BASICS: History of Java, Java buzzwords, JVM architecture, data types, variables, scope and life time of variables, operators, control statements, type conversion and casting, arrays, classes and objects, nested and inner class, simple java program, constructors, methods, the abstract method, finalize method, method overloading, garbage collection, String and String Buffer handling functions, format function, Math, Wrapper, Random.

UNIT - II

INHERITANCE AND POLYMORPHISM: Relationship between objects, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance, member access rules, usage of this and super key word, method overriding, abstract classes, dynamic method dispatch, usage of final keyword, static import.

PACKAGES AND INTERFACES: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, defining an interface, implementing interface, variables in interface and extending interfaces.

I / O STREAMS: Concepts of streams, stream classes- byte and character stream, reading console input and writing console output, File: introduction to file, File operations, Random Access File.Exploring packages – java.io, java.util.

UNIT - III

EXCEPTION HANDLING: Exception handling fundamentals, exception types, uncaught exceptions, usage of try, catch, throw, throws and finally keywords, built-in exceptions, creating own exception sub classes.

MULTI THREADING: Concepts of thread, thread life cycle, creating threads using thread class and runnable interface, synchronization, thread priorities, inter thread communication.

UNIT - IV

AWT CONTROLS: The AWT class hierarchy, user interface components- labels, button, text components, check box, check box groups, choices, list box, panels - scroll pane, menu, scrollbars. Working with frame windows, color, font and layout managers.

EVENT HANDLING: Events, event sources, event listeners, relationship between event sources and listeners, delegation event model, handling mouse and keyboard events, adapter classes.

UNIT - V

SWINGS: Introduction to swings, hierarchy of swing components. Containers, top level containers - JFrame, JWindow, JApplet light weight containers - JPanel, swing components - JButton, JToggleButton, JCheckBox, JRadioButton, JLabel, JTextField, JTextArea, JList, JComboBox, JTable, JTree, JTabbedPanes, JScrollPanel.

APPLETS: Life cycle of an applet, inheritance hierarchy for applets, differences between applets and applications, developing applets, simple applet display methods, passing parameters to applets.

TEXT BOOK:

1. Herbert Schildt (2010), The complete reference, 7th edition, Tata Mcgraw Hill, New Delhi

REFERENCE BOOKS:

1. T. Budd (2009), An Introduction to Object Oriented Programming, 3rd edition, Pearson Education, India.
2. J. Nino, F. A. Hosch (2002), An Introduction to programming and OO design using Java, John Wiley & sons, New Jersey.
3. Y. Daniel Liang (2010), Introduction to Java programming, 7th edition, Pearson education, India.

JAVA PROGRAMMING LAB

(Common to CSE / IT)

Course Code: **A2509**

L	T	P	C
-	-	3	2

Week 1:

a) Write a Java program that prints all real solutions to the quadratic equation ax2+ bx + c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

b) The Fibonacci sequence is defined by the following rule: The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

c) Three friends Rahul, Anil, Anitha planned to go for dinner. Rahul has Rs.500, Anil has 600Rs, Anitha has 400Rs. Rahul will order rice but the bill should be in the range of 100 to 300. Anil should order Desserts and bill should be less than 200Rs. Anitha should order Soup but the bill must be for Rs.300.

- Calculate the total amount spent by the three.
- Check whether any two bill amounts are same.
- Calculate the remaining amount with them.

Week 2:

a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.

b) Write a Java program to multiply two given matrices.

c) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java.util).

Week 3:

a) Write a Java program that checks whether a given string is a Palindrome or not. Ex: MADAM is a palindrome.

b) Write a Java program for sorting a given list of names in ascending order.

c) Write a Java program to make frequency count of words in a given text.

Week 4:

a) Consider an identity card of an employee of a company requires the details such as first name, middle name; last name and convert each character from a word into uppercase and create a new word.

b) A team contains n members and display the names of n members whose name starts with ‘S’ and ends with ‘S’

Week 5:

a) Declare a class called employee having employee_id and employee_name as members. Extends class employee to have a subclass called salary having designation and monthly-salary as members. Define following

- Required constructor
- A method to find and display all details of employees drawing salary more than Rs.20000/-
- Method main for creating an array for storing these details.

b) A software company is maintaining an Employee list. Each employee should have employee name, and platform name and company is having employees from Java platform, .Net platform and RAD platform. Print the following

- Display all java platform employee
- Display all .Net Employee List
- Display all RAD Employee List

c) Create a class Account with two overloaded constructors. The first constructor is used for initializing, the name of account holder, the account number and the initial amount in the account. The second constructor is used for initializing the name of the account holder, the account number, the addresses, the type of account and the current balance. The Account class is having methods Deposit (), Withdraw (), and Get -Balance (). Make the necessary assumption for data members and return types of the methods. Create objects of Account class and use them.

Week 6:

a) Create overloaded methods named void calc_volume ( ), that has been overloaded to perform the following functions execute the overloaded methods and display the volume in the respective functions

- Volume of Sphere
- Volume of Cylinder
- Volume of Cone

b) Write a java program to create an abstract class named Shape that Contains an empty method named numberOfSides ( ).Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides ( ) that shows the number of sides in the given geometrical figures.

Week 7:

a) Write a program in Java which implements interface Student which has two methods Display_Grade and Attendance for PG_Students and UG_Students (PG_Students and UG_Students are two different classes).

b) Create an abstract base class shape with two members base and height, a member function for initialization and a function to compute area ( ). Derive two specific classes Triangle and Rectangle which override the function area ( ). Use these classes in a main function and display the area of a triangle and a rectangle.

Week 8:

a) Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 andNum2 is displayed in the Result field when the Div- id button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

b) In the CustomExceptionTest class, the age is expected to be a positive number. It would throw the user defined exception NegativeAgeException if the age is assigned a negative number.

Week 9:

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

b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.

c) Write a Java program that displays the number of characters, lines and words in a text file.

Week 10:

a) Write a program to illustrate creation of threads using runnable class. (Start method starts each of the newly created thread. Inside the run method there is sleep () for suspend the thread for 500 milliseconds).

b) Create a multithreaded program by creating a subclass of Thread and then creating, initializing, and staring two Thread objects from your class. The threads will execute concurrently and display Java is object oriented, secure, and multithreaded in console window.

Week 11.

a) Write a Java program that creates three threads. First thread displays “Good Morning” every one second, the Second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.

b) Write a Java program that correctly implements producer consumer.

Week 12:

a) Write a Java program that works as a simple calculator. Use a grid Layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.

b) Write a Java program for handling mouse events and key events.

Week 13:

a) Write a java program that simulates a traffic light. The program lets the user selects one of three lights: red, yellow, green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on then the program starts.

b) Write a Java program that allows the user to draw lines, rectangles and ovals.

c) Develop an applet that displays a simple message in center of the screen.

REFERENCE BOOKS:

1. T. Budd (2009), An Introduction to Object Oriented Programming, 3rd edition, Pearson Education, India.
2. J. Nino, F. A. Hosch (2002), An Introduction to programming and OO design using Java, John Wiley & sons, New Jersey.
3. Y. Daniel Liang (2010), Introduction to Java programming, 7th edition, Pearson education, India.
4. www.javatpoint.com
5. JAVA Programming Laboratory manual (Vardhaman Press).

II Year B. Tech. IT - III Semester

COMPUTER AIDED ENGINEERING DRAWING LAB

(Common to CSE / IT)

Course Code: **A2306**

L	T	P	C
-	-	3	2

UNIT - I

INTRODUCTION: Introduction to computer aided drafting, auto CAD commands, theory of projection, elements of projection, planes of projection, methods of projection.

ORTHOGRAPHIC PROJECTION: Lines used in general engineering drawing, types of surfaces, invisible lines, precedence of lines, selection of views, principles of multi view drawing, steps to draw orthographic views, orthographic projection of different objects.

UNIT - II

PROJECTION OF POINTS AND STRAIGHT LINES: Projection of points, various positions of straight lines w.r.t. reference planes, skew line, traces of line, projection of straight lines and traces.

UNIT - III

PROJECTION OF PLANES: Types of planes, projection of planes, traces of planes.

UNIT - IV

PROJECTION OF SOLIDS: Divisions of solids, polyhedra, solids of revolution, projection of solids in simple position, projection of solids with axis inclined to one reference plane and parallel to other.

UNIT - V

ISOMETRIC PROJECTIONS: Divisions of pictorial projection, divisions of axenometric projection, theory of isometric projection, isometric drawing, non-isometric drawing, isometric drawing from orthographic views for simple objects.

TEXT BOOKS:

1. D. M. Kulkarni, A. P. Rastogi, and A. K. Sarkar (2009), *Engineering Graphics with AutoCAD*, PHI Learning Private Limited, New Delhi.
2. Arshad Noor Siddiquee, Zahid Akhtar Khan, Mukhtar Ahmad (2006), *Engineering Drawing with a Primer on Autocad,* 2nd Edition, Prentice Hall, India.
3. Jolhe, Dhananjay (2006), *Engineering Drawing: With an Introduction to CAD*, Tata Mc Graw Hill, India.

REFERENCE BOOKS:

1. N. D. Bhatt, V. M. Panchal (2005), *Engineering Drawing*, 48th Edition, Charotar Publishing House, Gujarat.
2. K. R. Gopalakrishna (2005), *Engineering Graphics*, 32nd Edition, Subash Publishers, Bangalore.

II Year B. Tech IT – IV Semester

ENVIRONMENTAL SCIENCE

(Common to CSE / IT / EEE)

Course Code: **A2011**

L	T	P	C
4	-	-	4

UNIT – I
ENVIRONMENTAL SCIENCE INTRODUCTION AND NATURAL RESOURCES

INTRODUCTION: Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance .Need for Public Awareness.

NATURAL RESOURCES: Renewable and non-renewable resources .Natural resources and associated problems:

FOREST RESOURCES: Use and over – exploitation, deforestation, Timber extraction, Mining, dams and other effects on forest and tribal people.

WATER RESOURCES: Use and over utilization of surface and ground water, floods, drought, conflicts over water, dams – benefits and problems.

MINERAL RESOURCES: Use and exploitation, environmental effects of extracting and using mineral resources.

FOOD RESOURCES: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

ENERGY RESOURCES: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies.

LAND RESOURCES: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.

UNIT- II
ECOSYSTEM AND BIODIVERSITY

ECOSYSTEMS: Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem, Forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystems.

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

UNIT - III
ENVIRONMENTAL POLLUTION, GLOBAL ENVIRONMENTAL ISSUES AND CONTROL MEASURES

ENVIRONMENTAL POLLUTION: Definition, Cause, effects and control measures of air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution and nuclear hazards.

SOLID WASTE MANAGEMENT: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies.

DISASTER MANAGEMENT: Floods, earthquake, cyclone and landslides. E-waste and plastic waste-recycling and reuse.

WATER CONSERVATION: Rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case Studies. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.

UNIT- IV
GREEN ENVIRONMENTAL ISSUES

INTRODUCTION: Clean development mechanism, carbon foot printing, carbon credits, carbon sequestration, Polluter pay principle. Green building practices. Approaches to green computing and nanotechnology.IS014000. Role of information Technology in Environment and human health. Case Studies.

UNIT – V
ENVIRONMENTAL ETHICS, ENVIRONMENTAL IMPACT ASSESMENT & ROLE OF NGOs

ENVIRONMENTAL ETHICS: Environment Protection Act. -Air (Prevention and Control of Pollution) Act. - Water (Prevention and control of Pollution) Act -Wildlife Protection Act - Forest Conservation Act - Issues involved in enforcement of environmental legislation. Public awareness.

ENVIRONMENTAL IMPACT ASSESSMENT: Conceptual facts of EIA, Baseline date acquisition, planning and management of impact studies, operational aspects of EIA, methods for impact identification, prediction of impacts (air, water, noise, soil, biological and socio-economics). Environmental Management Plan. Role of NGOs in creating awareness among people regarding environmental issues.

TEXT BOOKS:

1. Erach Bharucha (2005), Textbook of Environmental Studies for Undergraduate Courses, Hyderabad, Universities Press.
2. Benny Joseph (2005), Environmental Studies, New Delhi, Tata McGraw Hill Publishing co. Ltd.

REFERENCE BOOKS:

1. Anubha Kaushik (2006), Perspectives in Environmental Science, 3rd Edition, New Delhi, New age international.
2. Anji Reddy .M (2007), Textbook of Environmental Sciences and Technology, Hyderabad, BS Publications.

DESIGN AND ANALYSIS OF ALGORITHMS

Course Code: A2507

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION: Algorithm, pseudo code for expressing algorithms, performance analysis-space complexity, time complexity, asymptotic notation- big (O) notation, omega notation, theta notation and little (o) notation, recurrences, probabilistic analysis, disjoint set operations, union and find algorithms.

DIVIDE AND CONQUER: General method, applications-analysis of binary search, quick sort, merge sort, strassen's matrix multiplication, finding the maxima and minima.

UNIT - II

GREEDY METHOD: General method, applications-job sequencing with dead lines, 0/1 knapsack problem, minimum cost spanning trees, single source shortest path problem, optimal storage on tapes.

GRAPHS (ALGORITHM AND ANALYSIS): Graphs-breadth first search and traversal, depth first search and traversal, spanning trees, connected components and biconnected components, articulation points.

UNIT - III

DYNAMIC PROGRAMMING: General method, applications-matrix chain multiplication, optimal binary search trees, 0/1 knapsack problem, all pairs shortest path problem, travelling sales person problem, reliability design, string editing.

UNIT - IV

BACKTRACKING: General method, applications-n-queen problem, sum of subsets problem, graph colouring, 0/1 knapsack problem, Hamiltonian cycles.

BRANCH AND BOUND: General method, applications - travelling sales person problem, 0/1 knapsack problem- LC branch and bound solution, FIFO branch and bound solution.

UNIT - V

LOWER BOUND THEORY: Comparison trees, oracles and adversary arguments, lower bounds through reductions.

NP-HARD AND NP-COMPLETE PROBLEMS: Basic concepts, non-deterministic algorithms, NP-hard and NP-complete classes, cook's theorem.

TEXT BOOK:

1. Ellis Horowitz, Satraj Sahni, Rajasekharam(2007), *Fundamentals of Computer Algorithms*, 2nd edition, University Press, New Delhi.

REFERENCE BOOKS:

1. R. C. T. Lee, S. S. Tseng, R.C. Chang and T. Tsai (2006), *Introduction to Design and Analysis of Algorithms A strategic approach*, McGraw Hill, India.
2. Allen Weiss (2009), *Data structures and Algorithm Analysis in C++*, 2nd edition, Pearson education, New Delhi.
3. Aho, Ullman, Hopcroft (2009), *Design and Analysis of algorithms*, 2nd edition, Pearson education, New Delhi.

II Year B. Tech. IT - IV Semester

FORMAL LANGUAGES AND AUTOMATA THEORY

(Common to CSE / IT)

Course Code: A2511

L	T	P	C
3	1	-	4

UNIT - I

FINITE AUTOMATA (FA):

Introduction, model and behavior, Deterministic Finite Automata (DFA) -Formal definition, simpler notations (state transition diagram, transition table), language of a DFA. Nondeterministic Finite Automata (NFA)- definition of NFA, language of an NFA, Equivalence of Deterministic and Nondeterministic Finite Automata, Applications of Finite Automata, Finite Automata with Epsilon Transitions, Eliminating epsilon transitions, Minimization of Deterministic Finite Automata, finite automata with output (Moore and Mealy machines).

UNIT - II

REGULAR EXPRESSIONS (RE): Introduction, algebraic laws for Regular Expressions, Finite Automata and Regular Expressions- from DFA's to Regular Expressions, converting Regular Expressions to Automata, applications of Regular Expressions.

REGULAR GRAMMARS: Definition, regular grammars and FA, FA for regular grammar, regular grammar for FA. Proving languages to be non-regular -Pumping lemma, applications. Closure properties of regular languages (Proofs are not required).

UNIT - III

CONTEXT FREE GRAMMARS (CFG):

Formal definition, sentential forms, leftmost and rightmost derivations, the language of a CFG. Derivation tree or parse tree, relationship between parse trees and derivations. Applications of Context Free Grammars, Ambiguous Grammar.

SIMPLIFICATION OF CFG: Removing useless symbols, Null (epsilon) - productions and unit productions. Normal forms: Chomsky Normal Form and Grieback Normal Form. Pumping lemma for Context Free Languages (CFL), applications. Closure properties of CFLs (Proofs are not required)

UNIT - IV

PUSHDOWN AUTOMATA (PDA): Definition of the Pushdown Automata, the languages of PDA (acceptance by final state and empty stack), Equivalence of PDA's and CFG's, Conversion of Pushdown Automata: Pushdown Automata to Grammars and vice versa. Deterministic PDA (DPDA) -definition, DPDAs and regular languages, DPDAs and CFLs. Languages of DPDAs

UNIT - V

TURING MACHINES (TM): Formal definition and behavior, languages of a TM, TM as accepters, TM as a computer of integer functions, Types of TMs.

RECURSIVE AND RECURSIVELY ENUMERABLE LANGUAGES (REL): Some properties of recursive and recursively enumerable languages, universal Turing machine, the Halting problem, undecidable problems about TMs.

COMPUTABILITY THEORY: Context sensitive language and linear bounded automata (LBA), Chomsky hierarchy, the classes P and NP, post's correspondence problem (PCP), undecidability of PCP.

TEXT BOOK:

1. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman (2007), Introduction to Automata Theory Languages and Computation, 3rd edition, Pearson Education, India.

REFERENCE BOOKS:

1. K. L. P Mishra, N. Chandrashekaran (2003), Theory of Computer Science-Automata Languages and Computation, 2nd edition, Prentice Hall of India, India.
2. John C. Martin (2003), Introduction to Languages and the Theory of Computation, 3rd edition, Tata McGraw Hill, New Delhi.
3. Daniel I. A. Cohen (2007), Introduction to Computer Theory, 2nd edition, John Wiley, New Delhi, India.

II Year B. Tech. IT - IV Semester

SOFTWARE ENGINEERING

(Common to CSE / IT)

Course Code: A2512

L	T	P	C
4	-	-	4

UNIT – I

INTRODUCTION TO SOFTWARE ENGINEEIRNG: The Evolving nature of software engineering, Changing nature of software engineering, Software engineering Layers, The Software Processes, Software Myths.

PROCESS MODELS: A Generic Process Model, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Spiral Model, the Unified Process, Personal and Team Process Models, the Capability Maturity Model Integration (CMMI).

UNIT – II

REQUIREMENTS ENGINEERING: Functional and Non-Functional Requirements, The Software requirements Document, Requirements Specification, requirements Engineering, Requirements Elicitation and Analysis, Requirement Validation, Requirement Management.

SYSTEM MODELING: Context Models, Interaction Models, Structural Models, Behavioural Model, Model-Driven Engineering.

DESIGN CONCEPTS: The Design Process, Design Concepts, The Design Models, Architectural Design: Software Architecture, Architectural Genres, Architectural Styles.

UNIT – III

DESIGN AND IMPLEMENTATION: The Object Oriented Design with UML, Design Patterns, Implementation Issues, Open Source Development.

USER INTERFACE DESIGN: The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

SOFTWARE TESTING STRATEGIES: A Strategic approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Validation Testing, System Testing, The Art of Debugging, White-Box Testing, Black Box Testing.

UNIT – IV

PRODUCT METRICS: A Frame Work for Product Metrics, Metrics for the Requirements Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing.

PROCESS AND PROJECT METRICES: Metrics in the Process and Project Domains, Software Measurements, Metrics for Software Quality.

RISK MANAGEMENT: Risk verses Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinements, Risk Mitigation Monitoring and Management (RMMM), The RMMM Plan.

UNIT - V

QUALITY MANAGEMENT: Quality Concepts, Software Quality, Software Quality Dilemma, Achieving Software Quality. Review Techniques, Reviews: A Formal spectrum, Informal Reviews, Formal Technical Reviews.

SOFTWARE QUALITY ASSURANCE: Background Issues, Elements of Software Quality Assurance, Tasks, Goals and Metrics, Software Reliability, the ISO 9000 Quality Standards.

TEXT BOOKS:

1. Roger S. Pressman (2011), *Software Engineering, A Practitioner's approach,* 7th edition, McGraw Hill International Edition, New Delhi.
2. Sommerville (2001), *Software Engineering,* 9th edition, Pearson education, India.

REFERENCE BOOKS:

1. K. K. Agarval, Yogesh Singh (2007), *Software Engineering,* 3rd edition, New Age International Publishers, India.
2. Lames F. Peters, WitoldPedrycz(2000), *Software Engineering an Engineering approach,* John Wiely& Sons, New Delhi, India.
3. Shely Cashman Rosenblatt (2006), *Systems Analysis and Design*, 6th edition, Thomson Publications, India.

II Year B. Tech. IT - IV Semester

UNIX PROGRAMMING

(Common to CSE / IT)

Course Code: A2513

L	T	P	C
4	-	-	4

UNIT - I :

INTRODUCTION TO UNIX AND UNIX UTILITIES: A brief history of UNIX, architecture of UNIX, features of UNIX, introduction to vi editor. General purpose utilities, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, detailed commands to be covered are passwd, tty, script, clear, date, cal, cp, mv,ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w, finger, ftp, telnet, rlogin.

TEXT PROCESSING AND BACKUP UTILITIES: Text processing utilities and backup utilities , detailed commands to be covered are cat, tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

UNIT - II

WORKING WITH THE BOURNE AGAIN SHELL (BASH): Wild characters ,Shell, shell responsibilities, types of shell, pipes and i/o redirection, shell as a programming language, shell syntax: variables, conditions, control structures, commands,command execution, here documents, and debugging scripts.

UNIX FILE STRUCTURE: Introduction to UNIX file system, inode (Index Node), file descriptors, system calls and device drivers, library functions. Low level file access: open, read, write, close, lseek, stat, fstat, lstat, ioctl, umask, dup and dup2. The Standard i/o library: fopen, fread, fwrite, fclose, fflush, fseek, fgetc, fputc, fgets. Formatted input and output: printf, fprintf, sprint, scanf, fscanf, and sscanf. File and directory maintenance: chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd, scanning directories: opendir, readdir, telldir, seekdir, closedir.

UNIT - III

PROCESS AND SIGNALS: Process, process identifiers, process structure: process table, viewing processes, system processes, process scheduling, starting new processes: waiting for a process, zombie processes, fork, vfork, exit, wait, waitpid, exec, signals functions, unreliable signals, interrupted system calls, kill, raise, alarm, pause, abort, system, sleep functions, signal sets.

DATA MANAGEMENT AND FILE LOCKING: Data Management: managing memory: malloc, free, realloc, calloc, file locking: creating lock files, locking regions, use of read and write with locking, competing locks, other lock commands, deadlocks.

UNIT - IV

INTER PROCESS COMMUNICATION: Pipe, process pipes, the pipe call, parent and child processes, named pipes: fifos, semaphores: semget, semop, semctl, message queues: msgget, msgsnd, msgrcv, msgctl, shared memory: shmget, shmat, shmdt, shmctl, ipc status commands.

UNIT - V

INTRODUCTION TO SOCKETS: Socket, socket connections - socket attributes, socket addresses, socket, connect, bind, listen, accept, socket communications.

TEXT BOOK:

1. W. Richard. Stevens (2005), Advanced Programming in the UNIX Environment, 1st edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS:

1. Sumitabha Das (2007), Your Unix The Ultimate Guide, Tata Mc graw Hill, New Delhi, India.
2. Neil Matthew, Richard Stones, Beginning Linux Programming (2011), 4th Edition, Wrox, USA.
3. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, (2002) UNIX Network Programming - The Sockets Networking API, 3rd edition, Volume 1, PHI Learning Private Limited India, New Delhi.

II Year B. Tech. IT - IV Semester

DATABASE MANAGEMENT SYSTEMS

(Common to CSE / IT)

Course Code: **A2514**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION: History of database systems, introduction to database management systems, database system applications, database systems versus file systems, view of data, data models, database languages- DDL & DML commands and examples of basic SQL queries, database users and administrators, transaction management, database system structure, application architectures.

DATABASE DESIGN: Introduction to database design and E-R diagrams, entities, attributes and entity sets, relationships and relationship sets, additional features of the E-R model, conceptual design with the E-R model, conceptual design for large enterprises

UNIT - II

THE RELATIONAL MODEL: Introduction to the relational model, integrity constraints over relations, enforcing integrity constraints, querying relational data, logical database design: E-R to relational, introduction to views, destroying/altering tables and views.

RELATIONAL ALGEBRA AND CALCULUS: Preliminaries, relational algebra operators, relational calculus - tuple and domain relational calculus, expressive power of algebra and calculus.

SQL: Overview, the form of a basic SQL query, union, intersect and except operators, nested queries, aggregate operators, null values, complex integrity constraints in SQL, cursors, triggers Introduction to PL/SQL, more on PL/SQL. stored procedures and functions, advantages of using a procedure or function, procedure versus functions.

UNIT - III

SCHEMA REFINEMENT AND NORMAL FORMS: Introduction to schema refinement, functional dependencies, reasoning about FDs. Normal forms: 1NF, 2NF, 3NF, BCNF, properties of decompositions, normalization, schema refinement in database design, other kinds of dependencies: 4NF, 5NF, DKNF, case studies

UNIT - IV

TRANSACTIONS MANAGEMENT: Transaction concept, transaction state, implementation of atomicity and durability, concurrent executions, serializability, recoverability, implementation of isolation, transaction definition in SQL, testing for serializability.

CONCURRENCY CONTROL AND RECOVERY SYSTEM: Concurrency control - lock based protocols, time-stamp based protocols, validation based protocols, multiple granularity, and deadlock handling. Recovery system – failure classification, storage structure, recovery and atomicity, log-based recovery, shadow paging, recovery with concurrent transactions, buffer management, failure with loss of non-volatile storage, advanced recovery techniques, remote backup systems.

UNIT – V

OVERVIEW OF STORAGE AND INDEXING: Data on external storage, file organizations and indexing, index data structures, comparison of file organizations, indexes and performance tuning. Tree structured indexing - intuition for tree indexes, indexed sequential access method (ISAM), B+ Trees - a dynamic tree structure.

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke (2007), *Database Management Systems*, 3rd edition, Tata McGraw Hill, New Delhi, India.
2. Abraham Silberschatz, Henry F. Korth, S. Sudarshan (2005), *Database System Concepts,* 5th edition, McGraw-Hill, New Delhi, India.

REFERENCE BOOKS:

1. Elmasri Navate (1994), *Fundamentals of Database Systems*, Pearson Education, India.
2. CJ date(2010),an Introduction to database Systems, 8th edition McGraw- Hill, New Delhi, India.

II Year B. Tech. IT - IV Semester

UNIX PROGRAMMING LAB

(Common to CSE / IT)

Course Code: **A2515**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

Week – 1 (Unix Utililities)

1. a) Study and Practice on various commands like man, passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find,unmask, ulimit, ps, who, w.
   b) Study and Practice on various commands like cat, tail, head , sort, nl, uniq, grep, egrep,fgrep cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

Week – 2 (Shell Programming)

2. a) Write a Shell Program to print all .txt files and .c files.
   b) Write a Shell program to move a set of files to a specified directory.
   c) Write a Shell program to display all the users who are currently logged in after a specified time
   d) Write a Shell Program to wish the user based on the login time.

Week – 3 (Shell Programming)

3. a) Write a Shell program to pass a message to a group of members, individual member and all.
   b) Write a Shell program to count the number of words in a file.
   c) Write a Shell program to calculate the factorial of a given number.
   d) Write a Shell program to generate Fibonacci series.

Week – 4 (Shell Programming)

4. a) Write a Shell program to print all prime numbers between 1 and n.
   b) Write a Shell program to count no of lines in a text file which starts with a specified letter (Use grep command).

Week – 5 (Simulation of Unix commands)

5. a) Simulate cat command.
   b) Simulate cp command.

Week – 6 (Simulation of Unix commands)

6. a) Simulate head command.
   b) Simulate tail command.

Week – 7(Simulation of Unix commands)

7. a) Simulate mv command.
   b) simulate ls | grep ^- | sort.

Week – 8(Signal handling)

8. a) Write a program to handle the signals SIGINT
   b) SIGQUIT
   c) SIGFPE

Week – 9(Inter process communication)

9. a) Implement Two way process communication using **pipes**
   b) using named pipes

Week – 10(Inter process communication)

10. a) Implement message queue form of IPC.
    b) Implement shared memory and semaphore form of IPC.

Week – 11(Socket programming)

11. Write a client and server program such that client sends a message and server echo's the message to the Client (using TCP/IP).

Week – 12(Socket programming)

12. Write a client and server program such that client sends name of the file and server returns the content of the file to the Client (using TCP/IP).

Week – 13(Socket programming)

13 Implement a echo server using UDP.

REFERENCE BOOKS:

1. Sumitabha Das (2007), Your Unix The Ultimate Guide, Tata Mc graw Hill, New Delhi, India.
2. Neil Matthew, Richard Stones, Beginning Linux Programming (2011), 4th Edition, Wrox, USA.
3. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, (2002) UNIX Network Programming - The Sockets Networking API, 3rd edition, Volume 1, PHI Learning Private Limited India, New Delhi.
4. Unix Programming Laboratory manual (Vardhaman Press).

DATABASE MANAGEMENT SYSTEMS LAB

(Common to CSE / IT)

Course Code: **A2516**

L	T	P	C
-	-	3	2

1. CASE STUDY :

SAILORS, RESERVES, BOATS DATA BASE:

In Database user has to maintain sailors information with sailors identity., and every sailor age is more than 25 years and has a rating i.e (rating >=10),the sailors re reserved the boats for shipment of goods. Each boat identified by Id, name, color Every sailors may reserve more than one boat. Reservation can noticed based on the date.

Answer to the following Queries:

1. Find the sids, names of sailors who have reserved boat 103?
2. Find the ids, names of sailors who have reserved a red boat?
3. Find the color of boats reserved by Lubber?
4. Find the sids, names of sailors who have reserved at least one boat?
5. Find the sids, names of sailors who have reserved a red or a green boat?
6. Find the sids, names of sailors who have reserved a red and a green boat?
7. Find the sids, names of sailors who have reserved at least two boats?
8. Find the sids of sailors with age over 20 who have not reserved a red boat?
9. Find the sids, names of sailors who have reserved all boats?
10. Find the sids, names of sailors who have reserved all boats called “INTERLAKE”?
11. Find the ids, name and ages of sailors with rating above 11?
12. Find the sname, bid and reservation date for each reservation?
13. Find sids of all sailors who have reserved all boats?
14. Find names and ages of all sailors?
15. Find sids of all sailors who have reserved a red boats?
16. Compute increments for the rating of sailors who have sailed two different boats on the same day?
17. Find the ages of sailors whose name begin and end with B and ha at least 3 characters?
18. Find sids of all sailors who have reserved a red boat but not a green boat?
19. Find the ids of sailors who have a rating of 10 o who have reserved boat 04?
20. Find the names of sailors who have not reserved a red boat?
21. Find sailors whose rating is better than some sailor called “Horatio”?
22. Find sailors whose rating is better than every sailor called “Horatio?
23. Find the sailors with highest rating?
24. Find average age of all sailors?
25. Find average age of all sailors with a rating of 10?
26. Count number of sailors.
27. Count number of different sailor with a rating of 10.
28. Find the names of sailors who are older than the oldest sailor with a rating of 10?
29. Find the age of youngest sailor for each rating level?
30. Find the average age of sailors for each rating level that has at least two sailors?

2. CASE STUDY :

BANK DATABASE:

A bank has many branches and a large number of customers. A customer can open different kinds of accounts with the bank. The bank keeps track of a customer by his SSN, name, address, and phone number. Age is used as a factor to check whether he is a major. There are different type of loans, each identified by a loan number. A customer can take out more than one type of loan, and all branches can give loans. Loans have a duration and interest rate. The account holder can enquire about the balance in his account, Draw an ER Diagram, data base design for the bank. Make suitable assumptions and use them in showing maximum and minimum cardinality ratio.

Answer to the following Queries:

1. List the details of customer of the bank?
2. Display details of loans?
3. List the details of the accounts?
4. List the details of customers and their cities?
5. Give the names and cities of residence of all employee who work for First Bank Corporation?
6. Find the names, street, addresses and cities of residence of all employees who work for First Bank Corporation and earn more than 10000/-?
7. Find the branch who has given a loan?
8. List in alphabetic order all customers who have a loan at the “perryridge” branch?
9. Find all employees in the database who do not work for First Bank Corporation.
10. Give all loans numbers for a loan made at the Perryidge branch with loan amount greater than 1200
11. Display loan numbers of those loans with loan amount between 80000/- and 1,00,000/-?
12. Find loan numbers in loan relation whose mount is NIL?
13. Find loan number of loans whose amount is >10000?
14. Find customer name, loan number, loan amount branch name for all loans?
15. Find customer name, loan number, loan amount branch name for all loans given by “perryridge” branch?
16. Find names of all branches that have asserts greater than all branches located in Brooklyn?
17. Find names of all branches that have asserts greater than at least one branch located in Brooklyn?
18. Find name of all customers whose street name includes the string Main?
19. Display all loans details in ascending order of amount and loan number?
20. Find distinct customers having an account or a loan or both with bank?
21. Find all customers who have both an account or and a loan with bank?
22. Find all customers who have an account but not a loan with bank?
23. Display details of customers who live in Harrison?
24. Find average balance of accounts?
25. Find total and average of all accounts and loans?
26. Find average balance for each customer who lives in Harrison and has at least 2 accounts?

3. CASE STUDY:

ORDER ENTRY DATABASE:

The problems use the Customer, Order Table, and Employee tables of the simplified Order Entry database. The Customer table records clients who have placed orders. The Order Table contains the basic facts about customer orders. The Employee table contains facts about employees who take orders. The primary keys of the tables are CustNo for Customer, EmpNo for Employee, and OrdNo for Order table. Note that the CustBalance column contains numeric data. The currency symbols are not stored in the database. The CustFirstName and custLastName columns are required (not null). In employee table EmpFirstName, EmpLastName, and EmpEMail columns are required (not null). The OrdDate column is required (not null). Identify the foreign keys and draw a relationship diagram for the simplified Order Entry database. The CustNo column references the Customer table and the EmpNo column references the Employee table. For each relationship, identify the parent table and the child table.

Answer for the following queries:

1. Show the result of a restrict operation that lists the orders in February 2007
2. Show the result of a restrict operation that lists the customers residing in Seattle, WA.
3. Show the result of a project operation that lists the CustNo, CustFirstName, and custLastName columns of the Customer table
4. Show the result of a project operation that lists the CustCity and CustState columns of the Customer table
5. Show the result of a natural join that combines the Customer and OrderTable tables**.**
6. Show the steps to derive the natural join for problem 10. How many rows and columns are in the extended cross product step?
7. Show the result of a natural join of the Employee and OrderTable tables
8. Show the result of a one-sided outer join between the Employee and Ordertable tables. Preserve the rows of the OrderTable table in the result.
9. Show the result of a full outer join between the Employee and OrderTable tables

10. Show the result of the restrict operation on Customer where the condition is CustCity equals "Denver" or "Seattle" followed by a project operation to retain the CustNo, CustFirstName, CustLastName, and CustCity columns.
11. Show the result of a natural join that combines the Customer and OrderTable tables followed by a restrict operation to retain only the Colorado customers (CustState = "CO").
12. Show the result of a summarize operation on Customer. The grouping column is CustState and the aggregate calculation is COUNT. COUNT shows the number of rows with the same value for the grouping column.
13. Show the result of a summarize operation on Customer. The grouping column is CustState and the aggregate calculations are the minimum and maximum CustBal values.
14. What tables are required to show the CustLastName, EmpLastName, and OrdNo columns in the result table?

4. CASE STUDY:

AIRLINE FLIGHT INFORMATION:

The Employee relation describes pilots and other kinds of employees as well as every pilot certified for some aircraft, and only pilots are certified to fly. Write a CREATE TABLE statement for the FLIGHTS table. Choose data types appropriate for the DBMS used in your course. Flights table have flno ,each flight have specific departure place , departure time and arrival place, arrival time. Distance is the numeric data travelled by flight. Price represents cost to travelled on specific flight. The currency symbols are not stored in the database. Write a CREATE TABLE statement for the AIRCRAFT table .Each aircraft have aid and aname and cruising range. The aname column required (not null). Write a CREATE TABLE statement for the CERTIFIED *table* have employee number and aircraft id. Take appropriate data types for these columns. Write a CREATE TABLE statement for the EMPLOYEE table have employee number, ename and their salary. Understand above description and create primary key and foreign key for appropriate columns.

Answer for the following queries:

1. Find the names of aircraft such that all pilots certified to operate them earn more than 80,000?
2. For each pilot who is certified for more than three aircraft, find the eid and the maximum cruising range of the aircraft that he (or she) is certified for.
3. Find the names of pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu.
4. For all aircraft with cruising range over 1,000 miles, _nd the name of the aircraft and the average salary of all pilots certi_ed for this aircraft.
5. Find the names of pilots certi_ed for some Boeing aircraft.
6. Find the aids of all aircraft that can be used on routes from Los Angeles to Chicago.
7. Identify the flights that can be piloted by every pilot who makes more than $100,000.(Hint: The pilot must be certi_ed for at least one plane with a su_ciently large cruising range.)
8. Print the enames of pilots who can operate planes with cruising range greater than 3,000miles, but are not certi_ed on any Boeing aircraft.
9. A customer wants to travel from Madison to New York with no more than two changes of flight. List the choice of departure times from Madison if the customer wants to arrive in New York by 6 p.m.
10. Compute the di_erence between the average salary of a pilot and the average salary of all employees (including pilots).
11. Print the name and salary of every non pilot whose salary is more than the average salary for pilots.

5. CASE STUDY:

COMPUTER SALES ADMINISTRATION SYSTEM:

A relational database is to be designed for a medium sized Company dealing with industrial applications of computers. The Company delivers various products to its customers ranging from a single application program through to complete installation of hardware with customized software. The Company employs various experts, consultants and supporting staff. All personnel are employed on long-term basis, i.e. there are no short-term or temporary staff. Although the Company is somehow structured for administrative purposes (that is, it is divided into departments headed by department managers) all projects are carried out in an inter-disciplinary way. For each project a project team is selected, grouping employees from different departments, and a Project Manager (also an employee of the Company) is appointed who is entirely and exclusively responsible for the control of the project, quite independently of the Company's hierarchy. The following is a brief statement of some facts and policies adopted by the Company.

- Each employee works in some department
- An employee may possess a number of skills

- Every manager (including the MD) is an employee
- A department may participate in none/one/many projects
- At least one department participates in a project
- An employee may be engaged in none/one/many projects

Answer to the following Queries:

1. Comprehend the data given in the case study by creating respective tables with primary keys and foreign keys wherever required.
2. Insert values into the tables created (Be vigilant about Master- Slave tables).
3. Retrieve the Projects developed by a particular Department.
4. List out the projects which exceeds deadline with respect to sysdate.
5. Retrieve the Departments which have not involved in any of the Projects developed by the organization.
6. List out the Team Members of a particular Manager.
7. List out the Managers involved in a particular (multidisciplinary) project.
8. List out the Projects developed by each Department.
9. Retrieve the multidisciplinary project which involves more than 2 Departments.
10. Display the Project details with Employees who have involved in its development.
11. Display the employee details according to Department. (Group By)
12. Display the project which ranks the second maximum budget.
13. Create a view which contains the Manager and his Team Member details.
14. Display the months between the starting date and ending date of each project.
15. Delete the department which didn't involve in any of the project development.

6. CASE STUDY:

STUDENT PROGRESS MONITORING SYSTEM:

A database is to be designed for a college to monitor students' progress throughout their course of study. The students are reading for a degree (such as BA, BA(Hons) MSc, etc) within the framework of the modular system. The college provides a number of modules, each being characterized by its code, title, credit value, module leader, teaching staff and the department they come from. A module is co-ordinated by a module leader who shares teaching duties with one or more lecturers. A lecturer may teach (and be a module leader for) more than one module. Students are free to choose any module they wish but the following rules must be observed: some modules require pre-requisites modules and some degree programmes have compulsory modules. The database is also to contain some information about students including their numbers, names, addresses, degrees they read for, and their past performance (i.e. modules taken and examination results).

The college will provide the data given below

- College code
- College Name
- College Location
- Seat Distribution

Answer to the following Queries:

1. Comprehend the data given in the case study by creating respective tables with primary keys and foreign keys wherever required.
2. Insert values into the tables created (Be vigilant about Master- Slave tables).
3. Display the Students who have taken M.Sc course.
4. Display the Module code and Number of Modules taught by each Lecturer.
5. Retrieve the Lecturer names who are not Module Leaders.
6. Display the Department name which offers 'English' module.
7. Retrieve the Prerequisite Courses offered by every Department (with Department names).
8. Present the Lecturer ID and Name who teaches 'Mathematics'.
9. Discover the number of years a Module is taught.
10. List out all the Faculties who work for 'Statistics' Department.
11. List out the number of Modules taught by each Module Leader.
12. List out the number of Modules taught by a particular Lecturer.
13. Create a view which contains the fields of both Department and Module tables. (Hint- The fields like Module code, title, credit, Department code and its name).
14. Update the credits of all the Prerequisite courses to 5.
15. Delete the module 'History' from the module table(Be vigilant about foreign key references).

7. CASE STUDY:

EMPLOYEE AND DEPARTMENT DATABASE:

The BlueX Company Pvt. Ltd. has maintaining Employee information contains employee details. The company has four departments. Any employee working in the company belongs to any one of the department. An employee joined in company above 25 years only. The company may give commission for every employee if and only if more than 2 years experience. Construct the database design with that there is no redundancy.

Answer to the following Queries:

1. List Employee Details.
2. List the department Details.
3. Update emp table and change employee name, ADAMS to ADAM.
4. Update emp table and change sal, comm. To 2000 &500 to an employeeno 7844.
5. Select deptno, dname ,of deptno>10 and located in 'NEWYORK'.
6. List all employee details who belongs to deptno=10 and whose job is clerk.
7. List all employee hired during 1981?
8. List all empno, ename of all employee in format "empno ename".
9. Find the total number of clerks in department 10?
10. Find the average salary of employees?
11. List all employee of their average salaries.
12. Find minimum salary paid employee and employee details with that salaries?
13. Find the name of employee which starts with 'A' and end with 'N'?
14. List all employees who have a salary greater than 15000 in the order of department number?
15. List deptno , dname ,min(sal) for all departments?
16. List all employees dept-wise and job –wise?
17. Display all employee names, number, deptname & location of all employees?
18. Find the employees belongs to the research department?
19. Find employee name employee number, their salary who were hired after 01/02/97
20. Find the second maximum salary of employee table?
21. Find employee name from employee table whose manager is nil?

8. CASE STUDY:

INVENTORY MANAGEMENT SYSTEM DATA BASE

There are many items in a departmental store, which are sold to customer and purchased from supplier. An order is placed by the customer-required details, which are listed below:

- Item name
- Quantity
- Delivery time

The order processing executes, look up the stock of each item(parts) is available or not then order fulfilled by the management of departmental store. The system periodically checks the stock of each item if it is found below the reorder level then purchase order placed to the supplier for that item, if the supplier is not able to supply whole order then rest of quantity supplied by the another supplier. After fulfilled the formalities, bill generated by the system and sent to the customer. Create a database design to maintained by the management for whole process is being done.

Answer to the following Queries:

1. Get supplier names for supplier who supply part P2.
2. Get supplier numbers for supplier in Paris with status >20.
3. Get supplier names for suppliers who supply at least one red part.
4. Display supplier names for supplier who supply at least one part supplied by supplier s2.
5. Get supplier names for supplier who supply all parts.
6. Get supplier names for suppliers who do not supply part P2.
7. Find supplier numbers for suppliers who supply at least all those parts supplied by supplier S2?
8. Get a part numbers for parts that either weight more than 16 pounds or are supplied by supplier S2, or both.

9. Display the total shipment quantity.
10. For each part, get the pat number and the total shipment quantity.
11. For each supplier, get the supplier number and the total number of parts supplied.
12. Get all “paris” of supplier numbers such that the who suppliers are located in the same city.
13. Get color and city for “non paris” parts with weight greater than ten.
14. For all parts, get the number and the weight of that part in grams.
15. Get full details of suppliers.
16. Get part number for all parts supplied by more than one supplier.
17. Get supplier numbers for supplier with less than the current maximum status in the “s” table.
18. Display supplier, parts, quantity for all parts.
19. Change the color of the part from green to brown.
20. Get supplier names for supplier who supply at least one brown part.

PL/SQL PROGRAMS

1. The L& T Pvt.ltd Company has maintaining Employee information contains employee details .The company has four departments. Any employee working in the company belongs to any one of the department. Write a PL/SQL block to insert a record in emp table and update the salaries of Blake and clark by 2000 and 1500.Thn check to see that the total salary does not exceed 20000 . If total >20000thn undo the updates made to salaries of Blake and clerk?
2. A table Product attributes pno, pname, sales price . A table old price attributes pno, old sales price. If the price of product pool1 is <4000 then change the price to 4000. The price change is to be recorded in the old price table with product number, date on which the price was last changed?
3. Write a PL/SQL block to find the number of occurrences of given digit in a given number.

CURSORS

1. Write a PL/SQL block that will display the name, dept no ,salary of fist highest paid employees**.**
2. Update the balance –stock in the item master table each time a transaction takes place in the item transaction table. The change in item master table depends on the itemID is already present in the item master then update operation is performed to decrease the balance stock by the quantity specified in the item transaction in case the itemid is not present in the item master table then the record is inserted in the item master table.
3. The table trans has the following structure acno, transtype, trans date. The table bank has acno, bal, minbal. Assuming that the same acno exists in both tables update the bank table. If transype=’d’ then Balance=bank.blance+trans.amount. if transtype=’w’ then balance = bank.balance-trans.amount. Take precaution in case of withdrawals.

FUNCTIONS AND PROCEDURES USING CONTROL STRUCTURES

1. Create a function o find the factorial of a given number and hence find NCR?
2. Write a PL/SQL block o pint prime Fibonacci series using local functions.
3. Create a procedure to find the lucky number of a given birth date?

TRIGGER

1. Convert employee name into uppercase whenever an employee record is inserted or updated Trigger to fire before the insert or update?
2. Trigger before deleting a record from emp table. Trigger will insert the row to be deleted into table.

REFERENCE BOOKS:

1. Raghurama Krishnan, Johannes Gehrke (2007), *Database Management Systems*, 3rd edition, Tata McGraw Hill, New Delhi, India.
2. Abraham Silberschatz, Henry F. Korth, S. Sudarshan (2005), *Database System Concepts,* 5th edition, McGraw-Hill, New Delhi, India.
3. DBMS Laboratory Manual (Vardhaman Press).

SYLLABI FOR V, VI, VII & VIII SEMESTERS

MICROPROCESSORS AND INTERFACING

(Common to CSE & IT)

Course Code: **A2419**

L	T	P	C
4	-	-	4

UNIT - I **(10 Lectures)**

INTRODUCTION: Architecture of 8086 microprocessor, Register organization, 8086 flag register and its functions, addressing modes of 8086, Pin diagram of 8086, Minimum mode & Maximum mode system operation, Timing diagrams.

UNIT - II **(12 Lectures)**

8086 FAMILY ASSEMBLY LANGUAGE PROGRAMMING: 8086 Instruction Set, Simple programs, Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation, assembler directives, procedures and macros.

UNIT - III **(12 Lectures)**

8086 MEMORY INTERFACING: 8086 addressing and address decoding, Interfacing RAM, ROM, EPROM to 8086.

8086 DIGITAL I/O INTERFACING: 8255 programmable Peripheral Interface, various modes of operation and interfacing to 8086, seven segment LED displays, stepper motor, D/A converter interfacing, Direct Memory Access (DMA) Data Transfer (8257).

UNIT - IV **(12 Lectures)**

INTERRUPTS AND PROGRAMMABLE INTERRUPT CONTROLLERS: 8086 Interrupts and Interrupt Responses introduction to DOS and BIOS interrupts. 8259A Priority Interrupt Controller.

SERIAL DATA TRANSFER SCHEMES: Asynchronous and synchronous data transfer schemes, RS - 232C Serial data standard, USART, sample program of serial data transfer.

UNIT – V **(10 Lectures)**

THE 8051 ARCHITECTURE: Introduction, 8051 micro controller hardware, external memory interfacing, Data transfer and logical instructions, arithmetic operations, decimal arithmetic, jump and call instructions and simple programs. The assembly language programming process, programming tools and techniques, counter and timers programming, interrupt programming.

8051 DIGITAL INTERFACING: Interfacing DC motor, Interfacing 4*4 Matrix Keypad, Interfacing to Alphanumeric Displays (LCD) & A/D converter interfacing, Serial Data Transfer.

Text Books:

1. Douglas V. Hall (2007), *Microprocessors Interface*, 2nd edition, Tata McGraw Hill, New Delhi.
2. Kenneth J. Ayala (2008), *The 8051 Microcontroller*, 3rd edition, Cengage Learning, India.

Reference Books:

1. Walter A. Triebel, Avtar Singh (2003), *The 8088 and 8086 Microprocessors* 4th Edition, Prentice Hall of India, New Delhi.
2. A. K. Ray, K M Bhurchandi (2006), Advanced Microprocessors and Peripherals, 2nd Edition, Tata McGraw Hill, New Delhi.
3. Deshmukh (2004), *Microcontrollers*, Tata McGraw Hill Edition, New Delhi.

Other Related Reference Books/Materials:

Muhammad Ali Mazidi, Janice Gillispie Mazidi & Rolin D.McKinley, *The 8051 Microcontroller and Embedded Systems using Assembly & C*, 2nd edition, Pearson Education, India.

COMPILER DESIGN
(Common to CSE & IT)

Course Code: **A2517**

L	T	P	C
3	1	-	4

UNIT –I **(12 Lectures)**

INTRODUCTION TO COMPILERS: Definition of compiler, interpreter and its differences, the phases of a compiler, lexical analysis-role of lexical analyzer, input buffering, pass and phases of translation, bootstrapping, LEX-lexical analyzer generator.

SYNTAX ANALYSIS: role of parser, context free grammar- derivations, parse trees, ambiguity, elimination of left recursion, left factoring, top-down parsing– backtracking, recursive-descent parsing, predictive parsers, LL(1) grammars.

UNIT –II **(12 Lectures)**

BOTTOM-UP PARSING: Definition of bottom-up parsing, handles, handle pruning, stack implementation of shift-reduce parsing, conflicts during shift-reduce parsing, LR parsers-simple LR, canonical LR and Look Ahead LR parsers, error recovery in parsing, parsing ambiguous grammars, YACC-automatic parser generator.

UNIT –III **(12 Lectures)**

SYNTAX-DIRECTED TRANSLATION: Syntax directed definition-synthesized and inherited attributes, evaluating an SDD at the nodes of a parse tree, evaluation orders for SDD's- S-attributed definitions, L-attributed definitions and dependency graphs. Applications of SDT-construction of syntax tree, translation schemes.
INTERMEDIATE CODE GENERATION: Intermediate forms of source programs– abstract syntax tree, polish notation and three address code, types of three address statements and its implementation, syntax directed translation into three-address code, translation of simple statements, Boolean expressions and flow-of-control statements.

UNIT –IV **(12 Lectures)**

TYPE CHECKING: Definition of type checking, type expressions, type systems, static and dynamic checking of types, specification of a simple type checker, equivalence of type expressions, type conversions, overloading of functions and operators.
RUN TIME ENVIRONMENTS: Source language issues, Storage organization, storage-allocation strategies, access to nonlocal names, parameter passing, symbol tables, and language facilities for dynamic storage allocation.

UNIT-V **(11 Lectures)**

CODE OPTIMIZATION: Organization of code optimizer, basic blocks and flow graphs, optimization of basic blocks, the principal sources of optimization, the dag representation of basic block, global data flow analysis.

CODE GENERATOR: Machine dependent code generation, object code forms, the target machine, a simple code generator, register allocation and assignment, peephole optimization.

Text Books:

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman (2011), *Compilers–Principles, Techniques and Tools*, Low price edition, Pearson Education.

Reference Books:

1. Alfred V. Aho, Jeffrey D. Ullman (2001), *Principles of compiler design*, Indian student edition, Pearson Education.
2. Kenneth C. Louden (2003), *Compiler Construction– Principles and Practice*, Thompson Learning.
3. Andrew W. Appel (2004), *Modern Compiler Implementation C*, Cambridge University Press.

COMPUTER NETWORKS
(Common to CSE & IT)

Course Code: **A2602**

L	T	P	C
3	1	-	4

UNIT I **(10 Lectures)**

INTRODUCTION: Network applications, Network hardware, Network software, Reference models: OSI, TCP/IP, and ARPANET.

THE PHYSICAL LAYER: Theoretical basis for communication, Guided transmission media, Wireless transmission, Modems.

UNIT - II **(14 Lectures)**

THE DATA LINK LAYER: Design issues, Error detection and correction, elementary data link protocols, sliding window protocols, example data link protocols - HDLC, PPP.

THE MEDIUM ACCESS SUBLAYER: Channel allocation problem, Multiple access protocols, Ethernet, Wireless LAN, Bluetooth.

UNIT – III **(16 Lectures)**

THE NETWORK LAYER: Network layer design issues, Routing algorithms, Congestion control algorithms, Internetworking, the network layer in the internet (IPv4 and IPv6), Quality of Service.

UNIT – IV **(10 Lectures)**

THE TRANSPORT LAYER: Transport service, Elements of transport protocol, Internet transport layer protocols: UDP, TCP and STCP, QOS in TCP and UDP.

UNIT – V **(10 Lectures)**

THE APPLICATION LAYER:

Domain Name System, Electronic mail, World Wide Web: architectural overview, dynamic web document and http. Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet.

Text Books:

1. A.S. Tanenbaum, Computer Networks (2011), 5th Edition, Pearson Education/ PHI. New Delhi, india.
2. Behrouz A. Forouzan (2012), 5th Edition, Data communication and Networking, Tata McGraw-Hill, India.

Reference Books:

1. Micheal A Gallo, Bill Hancock , (2001),Computer Communications and Networking Technologies,
2. Thomson Fitz Gerald, Dennis(2009), Business Data Communications & Networking, 10th Edition, John willeysons, USA.
3. William stallings (2006), Cryptography and network security, 4th edition, Pearson Education, India.
4. Jim kurose and Keiser Ross (2012), Computer Networking Top Down Approach, 6th Edition, Pearson Education.

WEB TECHNOLOGIES
(Common to CSE & IT)

Course Code: **A2603**

L	T	P	C
3	1	-	4

This course is designed in collaboration with Infosys Technologies Limited.

UNIT – I **(15 Lectures)**

INTRODUCTION TO HTML: Introduction to HTML, common Tags, Lists, Tables, Images, Forms, Frames, Cascading Style Sheets (CSS)

JAVA SCRIPT: Introduction, Control structures, Arrays, Functions and Objects in Java Script, Dynamic HTML with Java Script

UNIT – II **(09 Lectures)**

EXTENSIBLE MARKUP LANGUAGE: Introduction, XML-Documents, DTD, XML schema, XSLT, XML parsers-DOM, SAX.

UNIT – III **(15 Lectures)**

JAVA BEANS: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Bound properties, Bean Info Interface, Constrained properties, Persistence, Customizers, and Java Beans API.

DATABASE ACCESS: Database Programming using JDBC, Studying java.sql, Javax.sql.* package, Application – Specific Database Actions.

WEB SERVERS AND SERVLETS: Introduction to Web Servers, Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servlet Package, Reading Servlet parameters, and Reading Initialization parameters. The javax.servlet.http package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues, Accessing a Database from Servlet.

UNIT – IV **(12 Lectures)**

INTRODUCTION TO JSP: The Problem with Servlet, the Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC.

JSP APPLICATION DEVELOPMENT: Generating Dynamic Content, Using Scripting Elements, Implicit JSP Objects, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data between JSP pages, Deploying JAVA Beans in a JSP Page, Accessing a Database from a JSP Page.

UNIT – V **(09 Lectures)**

INTRODUCING PHP: Introduction, Creating PHP script- Variables, Constants, Data types, Operators, Control Structures, Arrays, Functions, Working with forms and Database.

INTRODUCTION TO AJAX: Introduction, Improving web page performance using Ajax, Programming in Ajax.

Text Books:

1. Kogent Learning solutions Inc sol (2009), Web Technologies – Black Book, Dreamtech press.
2. Hans Bergsten(2002), Java Server Pages 2nd edition, SPD O'Reilly.

Reference Books:

1. B. Boiko (2005), Content Management Bible, USA.
2. S. M. Grath (1998), XML by Example, 5th edition, Prentice Hall of India / Pearson Education, India.
3. C. Bates (2002), Web Programming building Internet Applications, 2nd edition, WILLEY Dream Tech, New Delhi, India.
4. Mathew Eernisse (2006), "Build Your Own AJAX Web Applications", SitePoint,.
5. Patrick Naughton and Herbert Schildt, "The complete Reference Java 2", 7th Edition (2007). TMH
6. Kathy Sierra(2008), Head First Servlets & JSP, Second Edition

WEB RESOURCES:

1. XML in 10 point. http://www.w3.org/XML/1999/XML-in-10-points.
2. Cascading Style Sheets from W3. http://www.w3.org/Style/CSS/
3. Java Programming http://www.apl.jhu.edu/~hall/java/

MOBILE APPLICATION DEVELOPMENT
(Common to CSE & IT)

Course Code: **A2604**

L	T	P	C
4	-	-	4

UNIT - I **(15 Lectures)**

Introduction to Mobile- A brief history of Mobile, The Mobile Ecosystem, Why Mobile? Types of Mobile Applications, Mobile Information Architecture, Mobile Design, Mobile 2.0, Mobile Web development, Small Computing Device Requirements.

Introduction to Android, History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture.

UNIT - II **(12 Lectures)**

Installing and using Eclipse with ADT plug - in, Installing Virtual machine for Android Sandwich/Jelly bean (Emulator), configuring the installed tools, creating a android project – Hello World, Run on Emulator, Deploy it on USB connected Android device

UNIT - III **(12 Lectures)**

User Interface Architecture Application context, Intents, Activity life cycle, Multiple screen sizes ,User Interface Design Form widgets, Text Fields, Layouts, Button Control, Toggle Buttons, Spinners(Combo boxes),Images, Menu, Dialog.

UNIT - IV **(12 Lectures)**

Fragments, Menu, Alarm Manager, Media Player, Graphics, Animation Camera, Telephony Manager

UNIT - V **(12 Lectures)**

Database Understanding of SQLite database, connecting with the database.

Generic Connection Framework: The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process.

Text Books:

1. Wei-Meng Lee(2011), “Beginning Android 4 Application Development”, Wiley Publishing, Inc.,
2. Pradeep Kothari(2014), “Android Application Development(with KitKat support) Black Book”, DreamTech Press

Reference Books:

1. James C.Sheusi(2013), “Android Application Development for Java Programmers”, Cengage Learning
2. Mark L Murphy(2009), “Beginning Android”, Wiley India Pvt Ltd
3. Sayed Y Hashimi and Satya Komatineni(2009), “Pro Android”, Wiley India Pvt Ltd

Web Resources:

1. developer.android.com

WIRELESS AND MOBILE COMPUTING

Course Code: A2605

L	T	P	C
4	-	-	4

UNIT - I **(13 Lectures)**

SATIELLITE SYSTEM: History, Applications, Routing, Localization, Handover.
WIRELESS LAN: Infrared vs. radio transmission, infrastructure and ad hoc networks, IEEE 802.11.
HIPER LAN: Protocol architecture, physical layer, channel access control sub-layer, MAC sub-layer, information bases and networking.

UNIT - II **(12 Lectures)**

MOBILE COMPUTING: Introduction, history, architecture, devices and applications, limitations.
GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS (GSM): Mobile services, System architecture, Radio interface, Protocols, Localization and Calling, Handover, Security, and New Data services.
MEDIUM ACCESS CONTROL: Motivation for a specialized MAC (Hidden and exposed terminals, near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT - III **(12 Lectures)**

MOBILE NETWORK LAYER: Mobile IP (goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, Registration, tunneling and encapsulation, optimizations), dynamic host configuration protocol (DHCP).
MOBILE ADHOC NETWORKS (MANETS): Overview, properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs**.**
MOBILE TRANSPORT LAYER: Traditional TCP, indirect TCP, snooping TCP, mobile TCP, fast retransmit/ fast recovery, transmission /time-out freezing, selective retransmission, transaction oriented TCP.

UNIT - IV **(11 Lectures)**

DATA DISSEMINATION: Push based mechanisms, pull based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.
DATABASE ISSUES: Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

UNIT - V **(12 Lectures)**

PROTOCOLS AND TOOLS: Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (user scenarios, physical layer, MAC layer, networking, security, link management).
J2ME: Java 2 Micro Edition Overview, J2ME and Wireless Devices Small Computing Technology, Mobile Radio Networks, PDAs (Personal Digital Assistants)

Text Books:

1. Jochen Schiller (2004), Mobile Communications, 2nd edition, Low price edition, Pearson Education, New Delhi.
2. Rajkamal (2007), Mobile Computing, 2nd edition, Oxford University Press, USA.

Reference Books:

1. Stojmenovic, Cacute (2002), Handbook of Wireless Networks and Mobile Computing, John Wiley, New York.
2. Hansmann, Merk, Nicklous, Stober(2003), Principles of Mobile Computing, 2nd edition, Springer, New Delhi, India.
3. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.

MICROPROCESSORS AND INTERFACING LAB
(Common to CSE & IT)

Course Code: **A2424**

L	T	P	C
-	-	3	2

LAB EXPERIMENTS:

PART - A

MICROPROCESSOR 8086 PROGRAMMING USING MASM:

1. Programs involving data Transfer Instructions
    i. Byte and word transfer in different addressing modes
    ii. Block move without overlapping
    iii. Block move with overlapping
    iv. Block interchanging
2. Programs involving arithmetic and logical operations like addition and subtraction of multi- precision numbers
    a. Addition and Subtraction of Multi precision numbers
    b. Multiplication and division of signed and unsigned Hexadecimal numbers
    c. ASCII adjustment instructions
    d. Code Conversion
    e. Arithmetic program to find square, cube, LCM, GCD and factorial
3. Programs involving bit manipulation instructions like checking
    a. If given data is positive or negative
    b. If given data is odd or even
    c. Logical ones and zeros in a given data
    d. 2 out of 5 code
    e. Bit wise palindrome
    f. Nibble wise palindrome
4. Programs involving Branch / Loop instructions like:
    a. Programs on arrays: addition/subtraction of N nos., finding largest/smallest no., ascending/descending order, etc.
    b. Near and Far Conditional and Unconditional jumps, Calls and Returns
5. Programs on String Manipulations like string transfer, string reversing, searching for a character in a string, palindrome etc.
6. Programs involving on Software Interrupts
7. Programs to use DOS interrupt INT 21H Function calls for:
    a. Reading a Character from Keyboard, Buffer Keyboard input
    b. Display of characters/String on console
    c. Creation of a new file, read/write from a file,
    d. Read system date, set system date, read system time, set system time

PART – B

INTERFACING 8086 TO OTHER PERIPHERAL USING TRAINER KITS:

1. Experiments on interfacing 8086 with the following modules through 8255 PPI/ 8257 DMA / 8259 PIC
    a. A/D and D/A converters
    b. Matrix keyboard interface
    c. Seven segment display interface
    d. Logical controller interface
    e. Stepper motor interface
    f. Traffic signals by interfacing traffic controller to 8086
    g. Real time Clock using PIT 8253/8254
2. Interfacing a printer to an 8086 Microcomputer kit.

Text Books/ Reference Books / materials:

1. Douglas V.Hall, Microprocessors Interface, 2nd Edition, 2007, TMH.
2. Liu and GA Gibson (1988), Micro Computer System 8066/8088 Family Architecture, programming and Design, 2ndEdition, PHI, India.
3. Walter A.Triebel, Avtar Singh (2003), the 8088 and 8086 Microprocessors 4th Edition, PHI, India.

WEB TECHNOLOGIES LAB
(Common to CSE & IT)

Course Code: **A2606**

L	T	P	C
-	-	3	2

WEB TECHNOLOGIES LAB EXPERIMENTS:

1. Design the following static web pages required for an online book store website
   i. Home Page
   ii. Login Page
   iii. Catalogue Page

2. Design the following static web pages required for an online book store website
   i. Cart Page
   ii. Registration Page

3. Design a web page using CSS which includes the following styles
   i. Using different font styles
   ii. Set a background image for both page and single elements on the page
   iii. Control the background repetition of image with background-repeat property
   iv. Define styles for links as visited, active, hover & link
   v. Work with layers
   vi. Add a customized cursor

4. Write a JavaScript to validate the fields of registration page.
5. Create an XML document for maintaining a CD catalog and Display XML data using XSL
6. Write a program to create a Java Bean for user login management component.
7. Write a program to implement Scrollable Result Set.
8. Install Apache Tomcat Server and deploy a static website and access it.
9. Write a program to create a Servlet to AUTHENTICATE user details.
10. Write a program to implement session management concept in Servlets.
11. Write a program to access database using JDBC and Servlets.
12. Write a program to print multiplication table for any number up to required level using JSP.
13. Write a program to display user credentials using use Bean tag of JSP.
14. Write a program to demonstrate JSP and JDBC.
15. Write a program to validate the user form using PHP.

Text Books/ Reference Books / materials:

1. Kogent Learning solutions Inc sol(2015),"Web Technologies – Black Book", Dreamtech press.
2. Patrick Naughton and Herbert Schildt(2006), "The complete Reference Java 2", 7th Edition, TMH.
   Hans Bergsten(2003), "Java Server Pages", 3 rd Edition, SPD O'Reilly.

EMBEDDED SYSTEMS
(Common to CSE & IT)

Course Code: **A2425**

L	T	P	C
4	-	-	4

UNIT - I **(11 Lectures)**

EMBEDDED COMPUTING: Introduction, complex systems and microprocessor, the embedded system design process, formalisms for system design, design examples.

UNIT - II **(12 Lectures)**

INTRODUCTION TO REAL-TIME OPERATING SYSTEMS: Tasks and task states, tasks and data, semaphores, and shared data; message queues, mailboxes and pipes, timer functions, events, memory management, interrupt routines in an RTOS environment.

BASIC DESIGN USING A REAL-TIME OPERATING SYSTEM: Principles, semaphores and queues, hard real-time scheduling considerations, saving memory and power, an example RTOS like u-COS (open source).

UNIT - III **(11 Lectures)**

EMBEDDED SOFTWARE DEVELOPMENT TOOLS: Host and target machines, linker/locators for embedded software, getting embedded software into the target system.

DEBUGGING TECHNIQUES: Testing on host machine, using laboratory tools, an example system.

UNIT - IV **(11 Lectures)**

INTRODUCTION TO ADVANCED ARCHITECTURES: ARM and SHARC, processor and memory organization and instruction level parallelism; networked embedded systems: bus protocols, I2C bus and CAN bus; internet-enabled systems, design example elevator controller.

UNIT - V **(11 Lectures)**

MULTIPROCESSORS: Introduction, Importance of Multiprocessors, CPUs and Accelerators, Multiprocessor Performance Analysis, Consumer Electronics Architecture, Cell Phones, Audio Players, Digital Still Cameras, Video Accelerator.

TEXT BOOKS:

1. Wayne Wolf (2008), *Computers as Components-principles of embedded computer system design*, Elseveir, New Delhi, India.
2. Kenneth J. Ayala (2008), *The 8051 Microcontroller*, 3rd edition, Cengage Learning, India.
3. David E. Simon (1999), *An Embedded Software Primer*, Pearson Education, India.

REFERENCE BOOKS:

1. Jean J. Labrosse (2000), *Embedding System Building Blocks,* 2nd edition, CMP publishers, USA.
2. Raj Kamal (2004), *Embedded Systems*, Tata McGraw hill, India.
3. Ajay V. Deshmukh (2005), *Micro Controllers*, Tata McGraw hill, India.
4. Frank Vahid, Tony Givargis (2002), *Embedded System Design*, John Wiley, India.

OTHER RELATED REFERENCE BOOKS / MATERIALS:

1. Muhammad Ali Mazidi, Janice Gillispie Mazidi & Rolin D.McKinley, *The 8051 Microcontroller and Embedded Systems using Assembly & C*, 2nd edition, Pearson Education, India.

OBJECT ORIENTED ANALYSIS AND DESIGN
(Common to CSE & IT)

Course Code: A2520

L	T	P	C
3	1	-	4

UNIT – I **(13 Lectures)**

INTRODUCTION TO UML: Importance of modeling, principles of modeling, object oriented modeling, overview of UML, conceptual model of the UML, Architecture, Software Development Life Cycle.

BASIC STRUCTURAL MODELING:
Classes, Relationships, common Mechanisms, Diagrams.

UNIT – II **(13 Lectures)**

ADVANCED STRUCTURAL MODELING: Advanced classes, advanced relationships, Interfaces, Packages.

Class Diagrams: Terms and concepts, common modeling techniques.

Object Diagrams: Terms, concepts, common modeling techniques.

BASIC BEHAVIORAL MODELING-I: Interactions, **Interaction Diagrams:** Terms, Concepts, Common modeling Techniques

UNIT – III **(13 Lectures)**

BASIC BEHAVIORAL MODELING-II, Use cases, **Use case Diagrams:** Terms and Concepts, Common Modeling Techniques.
Activity Diagrams: Terms and Concepts, Common Modeling Techniques**.**

ADVANCED BEHAVIORAL MODELING: Events and signals, State machines, Processes and Threads, Time and space.**State chart Diagrams:** Terms and Concepts, Common Modeling Techniques.

UNIT – IV **(9 Lectures)**

ARCHITECTURAL MODELING: Components, Terms and Concepts, Common Modeling Techniques.
Component Diagrams: Common Modeling Techniques, Deployment, Terms and Concepts, Common Modeling Techniques. **Deployment Diagrams:** Terms and Concepts, Common Modeling Techniques.

UNIT – V **(6 Lectures)**

SYSTEMS AND MODELS: Systems, subsystems, models, and view, modeling the architecture of a system, modeling systems of systems,

CASE STUDY: The Unified Library application. Prepare a report on Unified Library Application with the following UML diagrams: Class, Object, Use Case, Interaction, State Chart, Activity, Component, and Deployment diagrams.

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson (1999), “The Unified Modeling Language user guide pearson edition.

REFERENCE BOOKS:

1. Atul Kahate(2004), “Object Oriented Analysis and Design”
2. Hans-Erikson, David Fado Wiley (2009), “UML 2 toolkit” Wiley Publishing, Inc.
3. Mellir Page-Jone (2004), “Fundamentals of Object Oriented design in UML”

DATA MINING AND DATA WAREHOUSING
(Common to CSE & IT)

Course Code: **A2523**

L	T	P	C
4	-	-	4

UNIT – I **(10 lectures)**

INTRODUCTION TO DATA MINING: Motivation, Importance, Definition of Data Mining, Kind of Data, Data Mining Functionalities, Kinds of Patterns, Classification of Data Mining Systems, Data Mining Task Primitives, Integration of A Data Mining System with A Database or Data Warehouse System, Major Issues In Data Mining.

PREPROCESSING: Types of Data Sets and Attribute Values, Basic Statistical Descriptions of Data, Data Visualization, Measuring Data Similarity, Data Quality, Major Tasks in Data Preprocessing, Data Cleaning and Data Integration and Transformation, Data Reduction and Data Discretization.

UNIT – II **(12 lectures)**

DATA WAREHOUSING AND ON-LINE ANALYTICAL PROCESSING: Data Warehouse basic concepts, A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehousing to Data Mining.

DATA CUBE TECHNOLOGY: Efficient Methods for Data Cube Computation, Further Developments of Data Cube and OLAP Technology, Data Generalization by Attribute-Oriented Induction.

UNIT – III **(12 lectures)**

MINING FREQUENT PATTERNS, ASSOCIATIONS AND CORRELATIONS: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Are All the Pattern Interesting, Pattern Evaluation Methods, Applications of frequent pattern and associations.

FREQUENT PATTERN AND ASSOCIATION MINING: A Road Map, Efficient and Scalable Frequent Itemset Mining Methods, Mining Various Kinds of Association Rules, From Association to Correlation Analysis, Constraint-Based Association Mining.

UNIT – IV **(15 lectures)**

CLASSIFICATION AND PREDICTION: Basic Concepts, Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification Methods, Rule-Based Classification, Classification by Back propagation, Support Vector Machines, Associative Classification, Lazy Learners, Other Classification Methods, Prediction: Accuracy and Error Measures, Evaluating the Accuracy of Classification and Prediction, Techniques to Improve Classification Accuracy: Ensemble Methods, Model Selection.

UNIT – V **(12 lectures)**

CLUSTER ANALYSIS: Basic Concepts of Cluster Analysis, Types of Data in Cluster Analysis, Categorization of Major Clustering Approaches, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid – Based Methods, Model-Based Clustering - The Expectation-Maximization Method, Other Clustering Techniques, Clustering High-Dimensional Data, Constraint-Based and User-Guided Cluster Analysis.

OUTLIER ANALYSIS: Why outlier analysis, Identifying and handling of outliers, Distribution-Based Outlier Detection: A Statistics-Based Approach, Classification-Based Outlier Detection, Clustering-Based Outlier Detection, Deviation-Based Outlier Detection, Isolation-Based Method: From Isolation Tree to Isolation Forest.

Text Books:

1. Jiawei Han, Micheline Kamber, Jian Pei (2012), *Data Mining: Concepts and Techniques*, 3rd edition, Elsevier, United States of America.

Reference Books:

1. Margaret H Dunham (2006), *Data Mining Introductory and Advanced Topics*, 2nd edition, Pearson Education, New Delhi, India.
2. Amitesh Sinha(2007), *Data Warehousing*, Thomson Learning, India.
3. Xingdong Wu, Vipin Kumar (2009), *The Top Ten Algorithms in Data Mining*, CRC Press, UK.
4. Max Barmer(2007), *Principles of Data Mining*, Springer, USA.

NETWORK SECURITY AND CRYPTOGRAPHY
(Common to CSE & IT)

Course code: A2607

L	T	P	C
3	1	-	4

UNIT – I **(12 Lectures)**

INTRODUCTION: Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services and Security Mechanisms, A model for Network security.

CLASSICAL ENCRYPTION TECHNIQUES: Symmetric Cipher Modes, Substitute Techniques, Transposition Techniques, Stenography.

UNIT – II **(13 Lectures)**

BLOCK CIPHER AND DATA ENCRYPTION STANDARDS: Block Cipher Principles, Data Encryption Standards, the Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles.

ADVANCED ENCRYPTION STANDARDS: Evaluation Criteria for AES, the AES Cipher.

MORE ON SYMMETRIC CIPHERS: Multiple Encryption, Triple DES, Block Cipher Modes of Operation, Stream Cipher and RC4.

UNIT – III **(15 Lectures)**

PUBLIC KEY CRYPTOGRAPHY AND RSA: Principles Public key cryptosystems the RSA algorithm, Key Management, Diffie-Hellman Key Exchange, Elliptic Curve Arithmetic, Elliptic Curve Cryptography.

MESSAGE AUTHENTICATION AND HASH FUNCTIONS: Authentication Requirement, Authentication Function, Message Authentication Code, Hash Function.

HASH AND MAC ALGORITHMS: Secure Hash Algorithm (SHA-512), Whirlpool, HMAC, CMAC.

UNIT – IV **(8 Lectures)**

DIGITAL SIGNATURE: Digital Signature, Authentication Protocols, Digital Signature Standard.

AUTHENTICATION APPLICATION: Kerberos, X.509 Authentication Service, Public Key Infrastructure.

UNIT – V **(16 Lectures)**

EMAIL SECURITY: Pretty Good Privacy (PGP) and S/MIME.

IP SECURITY: Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload.

WEB SECURITY: Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

FIREWALL: Firewall Design principles, Trusted Systems.

LEGAL AND ETHICAL ISSUES.

Text Books:

1. William Stallings (2006), “Cryptography and Network Security”, 5th edition, Pearson Education, India.

Reference Books:

1. William Stallings (2006), “Cryptography and Network Security”, 4th edition, Pearson Education, India.
2. William Stallings (2000), Network Security Essentials (Applications and Standards), Pearson Education, India.
3. Charlie Kaufman (2002), Network Security: Private Communication in a Public World, 2nd edition, Prentice Hall of India, New Delhi.
4. Atul Kahate (2008), Cryptography and Network Security, 2nd edition, Tata Mc Graw Hill, India.
5. Robert Bragg, Mark Rhodes (2004), Network Security: The complete reference, Tata Mc Graw Hill, India.

OPEN SOURCE TECHNOLOGIES
(Common to CSE & IT)

Course Code: **A2608**

L	T	P	C
3	1	-	4

UNIT – I **(10 Lectures)**

INTRODUCTION: Introduction to Open sources – Need of open Sources – Advantages of Open Sources – Application of Open sources. Open Source operating systems: Linux: Introduction – General Overview – Kernel Mode and user mode.

LINUX: Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals – Development with Linux.

UNIT – II **(12 Lectures)**

PHP: What is PHP? - Basic Syntax of PHP – programming in web environment - Common PHP Script Elements - Using Variables - Constants – Data types - Operators; Statements - Working with Arrays -Using Functions – String Manipulation and Regular Expression.

JQuery - JQuery Library- Scrolling effects, Ajax Introduction.

WORKING WITH FORMS -Processing Forms -Form Validation – Introduction to advanced PHP concepts.

UNIT – III **(12 Lectures)**

MySQL: Introduction - Setting up an account - Starting, Terminating and writing your own MySQL Programs - Record Selection Technology - Working with Strings - Date and Time - Sorting Query Results module - Generating Summary - Working with Metadata - Using Sequences – MySQL and Web

PHP and SQL database: PHP and LDAP ; PHP Connectivity ; Sending and receiving emails - Retrieving data from MySQL - Manipulating data in MySQL using PHP.

UNIT – IV **(12 Lectures)**

PYTHON: Introduction – Conditional Statements –looping-control statement-string manipulation – Lists and Tuples – Dictionaries – Functions - File Handling – Exception – Exception Handling.

UNIT – V **(10 Lectures)**

PERL: Perl back grounder- Perl overview-Perl parsing rules- Variables and Data – Statements and control structures – Subroutines, Packages, and Modules- Working with Files – Data Manipulation.

TEXT BOOKS:

1. Remy Card, Eric Dumas and Frank Mevel (2003), “The Linux Kernel Book “, Wiley Publications.
2. Steve Surching (2002), “MySQL Bible” , John Wiley.

REFERENCE BOOKS:

1. Rasmus Lerdorf and Levin Tatroe (2002), “Programming PHP”, O’Reilly.
2. Wesley J. Chun (2001) , “ Core Python Programming”, Prentice Hall.
3. Martin C.Brown (2009), “Perl: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint.
4. Steven Holzner (2009), “PHP: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint.
5. Vikram Vaswani (2009), “MYSQL: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint.

OPEN SOURCE TECHNOLOGIES LAB

Course Code: A2609 | **L T P C**
LAB EXPERIMENTS: | **- - 3 2**

MySQL:

Week 1:
1. Installing MySQL and establishing connection with PHP
2. Performing basic DML, DDL commands using MySQL

Week 2:
1. Performing different queries in MySQL
2. Build a small user interface consisting of name, rollnum, marks of 6 subjects for 5 students and display the topper among the 5 students using PHP, MySQL

PHP:

Week 3:
1. Write a program to list files in a directory using PHP
2. Write a program to upload image to MySQL database with PHP
3. Write a program to create a ZIP file using PHP

Week 4:
1 Write a program for PHP Pagination
2 Write a program for File download counter

Week 5:
1. Write a program for verifying Email address using MySQL databse with PHP
2. Write a program to Validate a PHP Form

PYTHON :

Week 6:
1. Python Program to Print the Fibonacci sequence
2. Python Program to Multiply Two Matrices
3. Python Program To Display Powers of 2 Using Anonymous Function

Week 7:
1. Python Program to Make a Simple Calculator
2. Python Program to Find Sum of Natural Numbers Using Recursion
3. Python Program to Sort Words in Alphabetic Order

Week 8:
1. Python Program to Handle Exceptions
2. Python Program to Find the sum of list elements
3. Python Program to read from a fie and write into a file

PERL:

Week 9:
1. Write a Program to calculate the sum of array elements Using subroutines in Perl.
2. Write a program for displaying list of prime numbers using Perl
3. Write a program for opening, reading, writing, closing files using Perl

Week 10:
1. Write a program for copying files using Perl
2. Write a program for string manipulation using Perl
3. Write a program to print the Matrix multiplication using Perl

Text Books/ Reference Books / materials:

1. Rasmus Lerdorf and Levin Tatroe, " Programming PHP", O'Reilly, 2002
2. Vikram Vaswani, "MYSQL: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009
3. Wesley J. Chun , " Core Python Programming", Prentice Hall, 2001
4. Martin C.Brown, "Perl: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
5. Steven Holzner, "PHP: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

CASE TOOLS AND DATA MINING LAB

Course Code: A2610

L	T	P	C
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LIST OF EXPERIMENTS:

PART - A: CASE TOOLS LAB

Draw the following UML diagrams for any four projects listed below.

UML diagrams to be developed are:

1. Use Case Diagram.
2. Class Diagram.
3. Sequence Diagram.
4. Collaboration Diagram.
5. Object Diagram
6. State Diagram
7. Activity Diagram.
8. Component Diagram
9. Deployment Diagram.

Suggested list of Projects:

1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Online course reservation system
6. E-ticketing
7. Software personnel management system
8. Credit card processing
9. E-book management system
10. Recruitment system
11. Foreign trading system
12. Conference Management System
13. BPO Management System

PART - B: Data Mining Lab

Week	Program Category	Experiments List
1	**Associations**	Derive associations manually from the following dataset. **Outlook Temperature Humidity Windy Play** Sunny Hot High False No Sunny Hot High True No Overcast Hot High False Yes Rainy Mild High False Yes Rainy Cool Normal False Yes Rainy Cool Normal True No Overcast Cool Normal True Yes Sunny Mild High False No Sunny Cool Normal False Yes Rainy Mild Normal False Yes Sunny Mild Normal True Yes Overcast Mild High True Yes Overcast Hot Normal False Yes Rainy Mild High True No
2	**Clustering**	i. Open Weka and Load the data set editor. Get familiarize with the editor operations. a. Load the weather. nominal dataset. Use the filter weka. Unsupervised, instance. Remove with Values to remove all instances in which the humidity attribute has the value high. To do this, first make the field next to the Choose button show the text Remove with Values. Then click on it to get the Generic Object Editor window, and figure out how to change the filter settings appropriately. b. Undo the change to the dataset that you just performed, and verify that the data has reverted to its original state. ii. Choosing k-means clustering algorithm for clustering use the Cancer data (.arff) perform clustering with a Euclidean distance function and visually inspect the nature of the clusters.each integer and the sum of all the integers (Use String Tokenizer class of java.util).
3	**Classification**	i. Choosing an appropriate filter for classification use the Iris data (.arff) perform classification and visualize the classification tree. ii. The glass dataset glass.arff from the U.S. Forensic Science Service contains data on six types of glass. Glass is described by its refractive index and the chemical elements that it contains; the aim is to classify different types of glass based on these features. This dataset is taken from the UCI datasets, which have been collected by the University of California at Irvine and are freely available on the Web. They are often used as a benchmark for comparing data mining algorithms. Find the dataset glass.arff and load it into the Explorer interface. For your own information, answer the following exercises. How many attributes are there in the dataset? What are their names? What is the class attribute? Run the classification algorithm IBk (weka.classifiers.lazy.IBk). Use cross-validation to test its performance.

SOFTWARE PROJECT MANAGEMENT
(Common to CSE & IT)

Course Code: **A2522**

L	T	P	C
4	-	-	4

UNIT - I **(14 Lectures)**

CONVENTIONAL SOFTWARE MANAGEMENT: The waterfall model, conventional software Management performance.

EVOLUTION OF SOFTWARE ECONOMICS: Software Economics, pragmatic software cost estimation.

IMPROVING SOFTWARE ECONOMICS: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections, the principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT - II **(13 Lectures)**

LIFE CYCLE PHASES: Engineering and production stages, inception, Elaboration, construction, transition phases. Artifacts of the process - the artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

MODEL BASED SOFTWARE ARCHITECTURES: A Management perspective and technical perspective. Workflows of the process - Software process workflows, Iteration workflows.

PROJECT ORGANIZATIONS AND RESPONSIBILITIES: Line of Business Organizations, Project Organizations, evolution of Organizations. Process automation - Automation Building blocks, The Project Environment.

UNIT - III **(12 Lectures)**

CHECKPOINTS OF THE PROCESS: Major mile stones, Minor Milestones, Periodic status assessments. Iterative process planning - Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT – IV **(12 Lectures)**

PROJECT CONTROL AND PROCESS INSTRUMENTATION: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation. Tailoring the process, process discriminates.

UNIT - V **(14 Lectures)**

NEXT GENERATION SOFTWARE ECONOMICS: Modern Project Profiles, Next generation Software economics, modern process transitions.

CASE STUDIES: The Command Center Processing and Display system- Replacement (CCPDS-R), Process Improvement and Mapping to the CMM.

Text Books:

1. Walker Royce (2005), Software Project Management, Pearson Education, India

Reference Books:

1. Bob Hughes, Mike Cottrell (2006), Software Project Management, Tata McGraw-Hill Edition, India.
2. Joel Henry (2003), Software Project Management, Pearson Education, India.

CLOUD COMPUTING
(Common to CSE & IT)

Course Code:A2611

L	T	P	C
4	-	-	4

UNIT – I **(10 Lectures)**

CLOUD COMPUTING BASICS: Cloud computing overview, applications, intranets and the cloud, first movers in the cloud.

YOUR ORGANIZATION AND CLOUD COMPUTING: When you can use cloud computing, benefits, limitations, security concerns, regulatory issues.

CLOUD COMPUTING WITH THE TITANS: Google, EMC, netapp, Microsoft, Amazon, salesforce.com IBM, partnerships

UNIT – II **(10 Lectures)**

THE BUSINESS CASE FOR GOING TO THE CLOUD: Cloud computing services, how those applications help your business, deleting your datacenter, salesforce.com and Thomson Reuters.

HARDWARE AND INFRASTRUCTURE: Clients, security, network, services.

ACCESSING THE CLOUD: Platforms, web applications, web APIs, web browsers.

UNIT – III **(10 Lectures)**

CLOUD STORAGE VENDORS: Overview of cloud storage, cloud storage providers

STANDARDS: Application, client, infrastructure, service.

UNIT – IV **(12 Lectures)**

DEVELOPING CLOUD SERVICES: Types of cloud service development, software as a service: overview, driving forces, company offerings, industries, software plus services: overview, mobile device integration, providers, Microsoft online, platform as a service, web services, on-demand computing, discovering cloud services, development services and tools

UNIT – V **(14 Lectures)**

DEVELOPING APPLICATIONS: Google, Microsoft, intuit quick base, cast iron cloud, bungee connect development, troubleshooting, application management.

LOCAL CLOUDS AND THIN CLIENTS: Virtualization in your organization, server solutions, thin client's case study: Mcneilus steel

MIGRATING TO THE CLOUD: Cloud services for individuals, cloud services aimed at the mid-market, enterprise-class cloud offerings, migration.

BEST PRACTICES AND THE FUTURE OF CLOUD COMPUTING: Analyze your service, best practices, how cloud computing might evolve

Text Books:

1. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter(2010), *Cloud Computing: A Practical Approach*, McGraw hill, New Delhi, India.
2. Michael Miller (2008), *Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online*, Que Publishing

Reference Books:

1. Haley Beard (2008), Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, 2nd edition, Emereo Pty Limited, USA.
2. Tim Mather, Subra Kumaraswamy, Shahed Latif (2009), Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance (Theory in Practice), 3rd edition, O'Reilly Media, Inc, India.

CYBER SECURITY
(Common to CSE & IT)

Course Code: A2612

L	T	P	C
3	1	-	4

UNIT -I **(10 Lectures)**

INTRODUCTION: Cyber Security– Cyber Security policy – Domain of Cyber Security Policy – Laws and Regulations – Enterprise Policy – Technology Operations – Technology Configuration - Strategy Versus Policy – Cyber security Evolution – Productivity – Internet – E-commerce – Counter Measures Challenges.

UNIT -II **(11 Lectures)**

CYBER SECURITY OBJECTIVES AND GUIDANCE: Cyber Security Metrics – Security Management Goals – Counting Vulnerabilities – Security Frameworks – E-Commerce Systems – Industrial Control Systems – Personal Mobile Devices – Security Policy Objectives – Guidance for Decision Makers – Tone at the Top – Policy as a Project – Cyber Security Management – Arriving at Goals – Cyber Security Documentation – The Catalog Approach – Catalog Format – Cyber Security Policy Taxonomy.

UNIT- III **(10 Lectures)**

CYBER SECURITY POLICY CATALOG: Cyber Governance Issues – Net Neutrality – Internet Names and Numbers – Copyright and Trademarks – Email and Messaging - Cyber User Issues – Malvertising – Impersonation – Appropriate Use – Cyber Crime – Geo location – Privacy - Cyber Conflict Issues – Intellectual property Theft – Cyber Espionage – Cyber Sabotage – Cyber Welfare.

UNIT- IV **(10 Lectures)**

CYBER MANGEMENT ISSUES: Fiduciary Responsibility – Risk Management – Professional Certification – Supply Chain – Security Principles – Research and Development – Cyber Infrastructure Issues – Banking and finance – Health care – Industrial Control systems.

UNIT -V **(10 Lectures)**

CASE STUDY: A Government's Approach to Cyber Security Policy

Textbooks:

1. Jennifer L. Bayuk , J. Healey , P. Rohmeyer , Marcus Sachs , Jeffrey Schmidt , Joseph Weiss,(2012) " Cyber Security Policy Guidebook" John Wiley & Sons.
2. Rick Howard,(2011), "Cyber Security Essentials" Auerbach Publications.

Reference Books:

1. Richard A. Clarke, Robert Knake(2010), " Cyberwar: The Next Threat to National Security & What to Do About It" Ecco 2010
2. Dan Shoemaker(2011), "Cyber security The Essential Body Of Knowledge", 1st ed. Cengage Learning.
3. Anti-Hacker Tool Kit (2011) by Mike Shema, Publication Mc Graw Hill, Indian Edition.
4. Nina Godbole and Sunit Belpure(2009), " Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Publication Wiley.

SOFTWARE TESTING AND QUALITY ASSURANCE
(Common to CSE & IT)

Course Code: **A2613**

L	T	P	C
3	1	-	4

UNIT – I **(12 Lectures)**

INTRODUCTION AND THE TAXONOMY OF BUGS: Purpose of testing, some dichotomies, a model for testing, the consequences of bugs, taxonomy for bugs, some bug statistics.

FLOW GRAPHS AND PATH TESTING: Path testing basics, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, implement and application of path testing.

UNIT – II **(13 Lectures)**

TRANSACTION FLOW TESTING AND DATA FLOW TESTING: Transaction flows, transaction flow testing techniques, dataflow testing basics, data flow testing strategies, application, tools and effectiveness.

DOMAIN TESTING: Domains and paths, nice and ugly domains, domain testing, domains and interfaces testing, domains and testability.

UNIT – III **(14 Lectures)**

PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS: Path products and path expressions, a reduction procedure, applications, regular expressions and flow anomaly detection.

LOGIC BASED TESTING: Motivational overview, decision tables, path expressions again, KV charts, specifications.

UNIT – IV **(12 Lectures)**

STATES, STATE GRAPHS AND TRANSITION TESTING: State graphs, good state graphs and bad, state testing, testability tips.

GRAPH MATRICES AND APPLICATIONS: Motivational overview, the matrix of a graph, relations, the powers of a matrix, node reduction algorithm, building tools

UNIT – V **(12 Lectures)**

DEFECT MANAGEMENT: Introduction, Defect classification, Defect Management process (approach), Defect Life Cycle, Defect Template, Management process (Fixing and root cause of defect), Estimate expected impact of defect, why defect management needs a risk discussion, techniques for finding defects, reporting a defect.

TESTING TOOLS: Introduction, features of a testing tool, guidelines for selection a tool, tools and skills of a tester, static testing tools, Dynamic testing tools, Advantages of Using testing tool, disadvantages of using testing tools, when to use automated testing tool, Testing using automated testing tools, Difficulties while introducing new tools, Process of procurement of COTS, procurement of tools from contractor, Advantages of the tools developed by external organizations, Contracting software, process of procurement of tools from contractor

Text book:

1. Boris Beizer (2004), “Software Testing Techniques”, 2nd edition, Dreamtech Press, New Delhi, India.
2. M.G. Limaye (2009), “Software Testing: Principles, Techniques and Tools” The McGra Hill, New Delhi, India.

Reference Books:

1. William E. Perry (2006), Effective methods of Software Testing, 3rd edition, John Wiley Edition, USA.
2. Meyers (2004), Art of Software Testing, 2nd edition, John Wiley, New Jersey, USA.

IV Year B. Tech IT - VII Semester

CLOUD COMPUTING LAB

Course Code: A2618

L	T	P	C
-	-	3	2

EXPERIMENTS LIST:

1. Software Study – Hadoop
2. Service Deployment & Usage over cloud
3. Managing Cloud Computing Recourses
4. Using cloud characteristics & Service models
5. With cloud computing as with data breaches it is a quest ion of “When” not “if”,so what can information security professionals do practically to manage security compliance In the cloud.
6. Performance evaluation of service over cloud.
7. Create a “N “ virtual machine in cloud environment .
8. Case Study: Google App Engine , Microsoft Azure
9. Case Study: Hadoop , Amazon, Aneka

Text Books / Reference Books / Materials :

1. Mastering Cloud Computing by Rajkumar Buyya, Christian Vecchiola, S Thamarai Selvi, TMH Publications.
2. Cloud Computing: Concepts, Technology & Architecture (The Prentice Hall Service Technology Services from Thomas Erl).
3. Microsoft System Center Building a Virtualized Network Solution, Second Edition by Nigel Cain, Michel Luescher, Damian Flynn and Alvin Morales.

IV Year B. Tech IT - VII Semester

SOFTWARE TESTING AND QUALITY ASSURANCE LAB
(Common to CSE & IT)

Course Code: A2619

L	T	P	C
-	-	3	2

EXPERIMENTS LIST:

1. Generate meaningful Unit test cases for the Project module-wise and test them for defects, identify the defects from the code and correct them. Try Identify the various unit test metrics studied already to identify module stability. Fill the unit test report supplied by the instructor.

2. Generate meaningful Integration test cases for the Project and test them for defects, identify the defects and correct them. Try Identify the various Integration test metrics studied already to identify module stability. Fill the Integration test report supplied by the instructor.

3. Generate meaningful System test cases for the Project and test them for defects, identify the defects and correct them. Try Identify the various System test metrics studied already to identify system stability. Fill the System test report supplied by the instructor.

4. Generate meaningful User Acceptance cases for the Project and test them for defects, identify the defects and correct them. Try Identify the various System test metrics studied already to identify system stability. Fill the System test report supplied by the instructor.

5. Test the supplied project/Application through testing tool: Win Runner, by generating appropriate test cases.

6. Test the supplied project/Application through testing tool: Load Runner by generating appropriate test cases.

7. Test the supplied project/Application through testing tool: Quick Test Professional by generating appropriate test cases

Text Books / Reference Books / Materials

1. Dr. K.V.K.K. Prasad (2007), Software Testing Tools, Dream tech Press.
2. Boris Beizer (2003), Software Testing Techniques, 2nd edition, Dream tech Press.

PROFESSIONAL ETHICS & INTELLECTUAL PROPERTY RIGHTS
(Common to ECE, EEE, CIVIL, CSE & IT)

Course Code: A2015

L	T	P	C
3	1	-	4

UNIT – I **(10 Lectures)**

ENGINEERING ETHICS: Senses of 'Engineering Ethics' -Variety of moral issues - Types of inquiry -Moral dilemmas Moral autonomy -Kohlberg's theory Gilligan's theory -Consensus and controversy – Models of Professional Roles -Theories about right action- Self interest - Customs and religion -Uses of Ethical theories.

HUMAN VALUES: Morals, values and ethics, integrity, work ethic, service learning, civic virtue, respect for others, living peacefully, caring, sharing, honesty, courage, valuing time, co-operation, commitment, empathy, self- confidence, character and spirituality.

UNIT – II **(10 Lectures)**

ENGINEERING AS SOCIAL EXPERIMENTATION: Engineering as experimentation, engineers as responsible experimenters, codes of ethics, a balanced outlook on law, the challenger case study.

UNIT – III **(14 Lectures)**

SAFETY, RESPONSIBILITIES AND RIGHTS: Safety and risk, assessment of safety and risk, risk benefit analysis and reducing risk, the Three Mile Island and Chernobyl case studies. Collegiality and loyalty, respect for authority, collective bargaining, confidentiality, conflicts of interest, occupational crime, professional rights, employee rights.

UNIT – IV **(10 Lectures)**

INTRODUCTION TO INTELLECTUAL PROPERTY: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

TRADEMARKS: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and evaluating trademarks, trademark registration process.

UNIT – V **(10 Lectures)**

LAW OF COPY RIGHTS : Fundamentals of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right.

LAW OF PATENTS: Foundation of patent law, patent searching process, ownership rights and transfer.

NEW DEVELOPMENTS IN INTELLECTUAL PROPERTY: Trademark law; Copy right law and Patent law, Trade secrets law, Intellectual property audits.

Text Books:

1. Mike Martin, Roland Schinzinger(1996), *Ethics in Engineering*, McGraw-Hill, New York.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S (2004), *Engineering Ethics*, Prentice Hall of India, New Delhi, India.
3. Deborah. E. Bouchoux (2009*), Intellectual property*, Cengage learning, India.
4. Deborah. E. Bouchoux (2001), *Protecting your companies intellectual property*, AMACOM, USA.

Reference Books:

1. Charles D. Fleddermann(2004), *Engineering Ethics*, Pearson Education / Prentice Hall, New Jersey.
2. Charles E Harris, Michael S. Protchard, Michael J Rabins(2000), *Engineering Ethics - Concepts and Cases*, Wadsworth Thompson Learning, United States.
3. John R Boatright(2003), *Ethics and the Conduct of Business*, Pearson Education, New Delhi.
4. Edmund G Seebauer and Robert L Barry, (2001), *Fundamentals of Ethics for Scientists and Engineers,* Oxford University Press, New York.

INDUSTRY ORIENTED DESIGN LAB

(Common to CSE / IT)

Course Code: **A2537**

L	T	P	C
-	-	6	2

Using any open source graphical user interface design software, design Home page for the following applications adopting GUI design principles.

1. A Multi specialty hospital
2. Alumni Registry website
3. Personal Net Banking
4. Pizza outlet
5. Software Training Institute
6. Furniture shop
7. Hostel accommodation
8. Resume builder
9. International conference on Computing
10. Computer sales and services shop
11. Bike rentals
12. State tourism website

MANAGEMENT SCIENCE
(INTERDEPARTMENTAL ELECTIVE-I)

Course Code: A2013

L	T	P	C
4	-	-	4

UNIT I

INTRODUCTION: Management - Definition, Nature, Importance of management Functions of Management - Taylor's scientific management theory, Fayol's principles of management, Contribution of Elton mayo, Maslow, Herzberg, Douglas MC Gregor, Basic concepts of Organisation- Authority, Responsibility, Delegation of Authority, Span of control, Departmentation and Decentralization - Organisation structures (Line organization, Line and staff organization, Functional organization, Committee organization, Matrix organization)

UNIT II

OPERATIONS MANAGEMENT: Plant location, Factors influencing location, Principles and types of plant layouts - Methods of production (job, batch and mass production), Work study - Basic procedure involved in method study and Work measurement.

UNIT III

QUALITY CONTROL AND MATERIALS MANAGEMENT: Statistical quality control – Meaning- Variables and attributes - X chart, R Chart, C Chart, P Chart, (simple Problems) Acceptance sampling, Sampling plans, Deming's contribution to quality. Materials management – objectives, Need for inventory control, Purchase procedure, Store records, EOQ, ABC analysis, Stock levels.

UNIT IV

HUMAN RESOURCE MANAGEMENT (HRM): Concepts of HRM, Basic functions of HR manager: Man power planning, Recruitment, Selection, Training and development, Placement, Wage and salary administration, Promotion, Transfers Separation, performance appraisal, Job evaluation and Merit rating.

UNIT V

PROJECT MANAGEMENT: Early techniques in project management - Network analysis: Programme evaluation and review technique (PERT), Critical path method (CPM), Identifying critical path, Probability of completing project within given time, Project cost analysis, project crashing (simple problems)

Text Books:

Dr. A.R.Aryasri, Management Science, TMH, 4th edition, 2009

Reference Books:

1. Koontz & weihrich – Essentials of management, TMH, 8th edition, 2010
2. Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi, 2004
3. O.P. Khana, Industrial engineering and Management L.S.Srinath, PERT & CPM .

HUMAN RESOURCE MANAGEMENT
(INTERDEPARTMENTAL ELECTIVE-I)

Course Code: A2016

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION HUMAN RESOURCE MANAGEMENT: Introduction and significance of HRM, Scope, functions of HRM, changing environment of HRM and Challenges. Human Resource Planning, Objectives, Factors influencing Human Resource planning, HR Planning Process.

UNIT - II

JOB ANALYSIS AND RECRUITMENT: Process and Sources of Recruitment; Selection, process of selection and techniques, Retention of Employees.

UNIT - III

HUMAN RESOURCES DEVELOPMENT: Training Vs Development, Need, Process of training, Methods of training, Training Evaluation, Career planning, Performance Management System, Methods of Appraisal, Common Errors.

UNIT - IV

COMPENSATION MANAGEMENT: Concepts and components of wages, Factors influencing wage fixation, Job evaluation, Methods of payment, Incentives and Fringe benefits.

UNIT - V

MANAGING INDUSTRIAL RELATIONS: Components of Industrial Relation, Trade Unions, functions of Trade Union, Employee Participation, Importance and Schemes, Collective Bargaining, Grievance Redressal, Industrial Dispute Settlement machinery.

Text Books:

1. Biswajeet Pattnayak (2009), *Human Resource Management*, Prentice hall of India, New Delhi, India.
2. R. Wayne Mondy and Robert M. Noe (2009), *Human Resource Management*, Pearson, India.

Reference Books:

1. Aswathappa. K. (2007), *Human Resources and Personnel Management*, Tata MC Graw Hill, New Delhi, India.
2. Monappa. A, Saiyadain. M. (1979), *Personnel Management*, Tata Mc Graw Hill, New Delhi, India.
3. C. B. Mamoria (2003), *Personnel Management*, Himalaya Publishing House, India.

ENTREPRENEURSHIP
(INTERDEPARTMENTAL ELECTIVE-I)

Course Code: A2017 **L T P C**
4 - - 4

UNIT - I

ENTREPRENEURSHIP: Importance and role of entrepreneurship, Characteristics of entrepreneurship, Qualities of an entrepreneur, Functions of entrepreneur; Theories of entrepreneurship, Stimulants of entrepreneurship and Barriers to entrepreneurship, Ethics and Social Responsibility, Role of entrepreneur in economic development.

UNIT - II

INSTITUTIONAL SUPPORT: Role of Government; Role of IDBI, SIDBI, SIDO, NIESBUD, SISI, DIC, Entrepreneurship Development Institute, MSMEs.

UNIT - III

WOMEN ENTREPRENEURSHIP: Role & Importance, Functions of women entrepreneur, Profile of Indian Women Entrepreneur, Problems of Women Entrepreneurs, Women Entrepreneurship Development in India and in Foreign Countries.

UNIT - IV

PROJECT MANAGEMENT: Concept of project and classification of project identification, project formulation - project report - project design, Project appraisal - profitability appraisal - project planning - social cost benefit analysis - financial analysis and project financing.

UNIT - V

TRAINING: Designing appropriate training programmes to inculcate Entrepreneurial Spirit, significance of entrepreneurial training, Training for New and Existing Entrepreneurs, Feedback and Performance of Trainees.

Text Books:

1. Robert Hisrich, Michael P. Peter, Dean A. Shepherd (2010), E*ntrepreneurship*, Tata Mc Graw Hill, New Delhi.

Reference Books:

1. Bholanath Datta (2009), *Entrepreneurship*, Excel publications, India.
2. David H Holt (2010), *Entrepreneurship*, Prentice hall of India, New Delhi, India.

BUSINESS COMMUNICATION
(INTERDEPARTMENTAL ELECTIVE-I)

Course Code: A2018

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO MANAGERIAL COMMUNICATION: Meaning, Importance and objectives, Principles of Communication, Forms of communication, Communication Process, Barriers To effective communication, Gateways to effective communication.

UNIT - II

NONVERBAL COMMUNICATION: Body Language, Gestures, Postures, Facial Expressions, Dress Code. Listening and Speaking Skills, Probing questions, Observation, Business and Social etiquette.

UNIT - III

MANAGERIAL SPEECHES: Principles of Effective Speech & Presentations. Technical and Non-technical presentations. Speech of introduction, speech of thanks, occasional speech, theme speech, Use of audio visual aids.

UNIT - IV

INTERVIEW TECHNIQUES: Mastering the art of conducting and giving interviews, Placement interviews, discipline/technical interviews, appraisal interviews, exit Interviews. *Group communication*: Importance, Meetings, group discussions, Video conferencing.

UNIT - V

INTRODUCTION TO BUSINESS CORRESPONDENCE: *Business letters*: Enquiries, Circulars, Quotations, Orders, Acknowledgments, Executions, Complaints, Persuading letters, Sales letters, Job application letters, Bio-data, Covering Letter, Interview Letters, Letter of Reference, Memos, minutes, Circulars and Notices. *Reports:* Types of Business Reports - Format, Choice of vocabulary, Coherence, paragraph writing, organization reports by individual, Report by committee.

Text Books:

1. Lesikar R. V, Flatley M. E (2005), *For Empowering the Internet Generation*, Tata McGraw Hill Publishing Company Ltd., New Delhi, India.
2. Ludlow. R, Panton. F (1998), *The Essence of Effective Communications*, Prentice Hall of India Pvt. Ltd., New Delhi, India.

Reference Books:

1. Adair .J (2003), *Effective Communication,* Pan Macmillan, London.
2. Pan Mcmillan Thill J. V, Bovee G. L (1993), *Excellence in Business Communication,* Tata McGraw Hill, New York.
3. Bowman J.P, Branchaw P. P (1987), *Business Communications: From Process to Product*, Dryden Press, Chicago.

PROJECT PLANNING AND MANAGEMENT
(INTERDEPARTMENTAL ELECTIVE-I)

Course Code: A2019

L	T	P	C
4	-	-	4

UNIT - I

PERT AND CPM : Introduction, origin of PERT and CPM, planning, scheduling and controlling, bar charts, milestone charts, weaknesses in bar charts, PERT and CPM networks comparison, event, activity, rules for drawing networks, numbering the events (Fulkerson's law), dummy activities.

UNIT - II

CPM - PERT NETWORK ANALYSIS : Time estimate, expected time, earliest allowable occurrence time, latest allowable occurrence time, slack, project duration, probability of completion, start and finish time estimates, floats, project scheduling, critical and sub-critical path. Updating - process of updating, when to update.

UNIT - III

CPM COST MODEL & RESOURCES ALLOCATIONS, RESOURCE SCHEDULING : Cost analysis, direct and indirect costs, operation time, normal and crash times and costs, optimizing project cost, crash limit, free float limit, optimization. Resource smoothening, resource leveling.

UNIT - IV

MANAGEMENT: Scope of construction management, significance of construction management, concept of scientific management, psychology in management, a historical account of management philosophy, qualities of manager, the roles/functions performed by effective and competent managers, the manager - as a decision maker, as a motivator, as a communication-link, as a conflict resolver, as a well wisher of co-employees and the employer etc.

UNIT - V

ORGANIZATION: Types of organization, merits and demerits of different types of organization, authority, policy, recruitment process and training; development of personnel department; labor problems; labor legislation in India; 'workmen's compensation act of 1923 and minimum wages act of 1948', and subsequent amendments. Safety in construction.

Text Books:

1. Punmia, Khandelwal (2006), *Project planning and control with PERT and CPM*, 3rd edition, Laxmi Publications, New Delhi, India.

Reference Books:

1. L. S. Srinath (1975), *PERT and CPM*, 2nd Edition, Afflicted East West Press Pvt. Ltd, New Delhi, India.
2. U. K. Shrivastava (1999), Construction Planning and Management, Galgotia Publications Pvt. Ltd., New Delhi,

ORGANIZATIONAL BEHAVIOR
(INTERDEPARTMENTAL ELECTIVE-I)

Course Code: A2020

L	T	P	C
4	-	-	4

UNIT - I

NATURE AND IMPORTANCE OF ORGANIZATIONAL BEHAVIOR: Foundation of O.B.; Conceptual Model for O.B. –Organization System in Global Environment – Importance of Interpersonal Skills, Challenges & Opportunities for O.B., Developing O.B. Model – Approaches to O.B.

UNIT - II

INDIVIDUAL BEHAVIOR – Diversity – Biographical Characteristics Ability – Implementing Diversity Management – Strategies – Attitudes & Job Satisfaction.

PERSONALITY: Theories of Personality –Perception – Process of Perception – Perception & Individual Decision Making – Motivation from concepts to Applications.

UNIT - III

GROUP BEHAVIOR – Foundations of Group Behavior – Defining and Classifying Groups – Stages of Group Development – Group Properties – Roles – Norms – Status, Size and Cohesiveness – Group Decision Making – Understanding Work Teams – Types of Teams – Creating Effective Teams.

LEADERSHIP THEORIES: Leadership Theories – Challenges to Leadership Construct – Finding and Creating Effective Leaders – Power & Polities.

UNIT - IV

MOTIVATION THEORIES: Maslow's Hierarchy of Needs, Two- factor theory of Motivation, Alderfer's ERG theory, McClelland's need based Motivational Model, Douglas McGregor Theories of X and Y.

FOUNDATION OF ORGANIZATIONAL STRUCTURE: Nature of organizing, organizational levels and span of control and types of span of control, factors determining span, organizational structure, departmentation and types of departmentation, making organizing effective.

UNIT - V

ORGANIZATIONAL CULTURE AND CLIMATE: Conflicts management, Organization Change & Stress Management – Self Management – Managing Careers.

TEXT BOOKS:

1. Stephen P. Robbins, Timothy (2012), *Organization Behaviour*,Ed. 14, Pearson Publications.
2. Mirza S Saiyadain (2011), *Organisation Behaviour*, TMH, New Delhi
3. Aryasri & VSP Rao (2009), *Management and Organisational Behaviour*, Excel Publications.

REFERENCE BOOKS:

1. Kavitha Singh (2009), *Organisational Behaviour*, Pearson Publictions
2. Aswathappa (2009), *Organisational Behaviour*,Himalaya Publictions
4. John M. Ivancevich (2009), *Organisational Behaviour & Management*, TMH, New Delhi
5. Koontz, Weihrich & Aryasri (2009), *Principles of Management*, TMH, New Delhi
6. Luthans, Fred (2009), *Organisational Behaviour*, 11/e, McGraw Hill, 2009.
7. Pierce and Gardner (2009), *Management and Organisational Behaviour: An Integrated Perspective*, Cengage
8. Deepak Kumar Bhattacharyya (2012), *Principles of Management-text and cases*, Pearson

DISTRIBUTED DATABASES
(INTERDEPARTMENT ELECTIVE- II)

Course Code: **A2532**

L	T	P	C
4	-	-	4

UNIT-I **(13 Lectures)**

INTRODUCTION: Introduction to Distributed Database Systems Features of distributed versus centralized databases, Distributed Database System Architecture; Top-Down Approach, Distributed Database Design Issues, Fragmentation, Allocation, Database Integration-Bottom-up approach, Schema Matching, Schema Integration, and Schema Mapping. Data and Access Control-View Management, Data Security; Query processing problem

UNIT-II **(10 Lectures)**

QUERY PROCESSING: Objectives of Query processing, Complexity of Relational Algebra Operations, Characterization of Query Processors, Layers of Query Processing-Query Decomposition, Normalization, Analysis, Elimination of Redundancy and Rewriting. Localization of Distributed Data-Reduction for primary Horizontal, Vertical, derived and Hybrid Fragmentation.

UNIT-III **(13 Lectures)**

OPTIMIZATION OF DISTRIBUTED DATABASES: Query optimization, centralized query optimization, Join Ordering, Static& Dynamic Approach, Semi-joins, Hybrid Approach.

DISTRIBUTED CONCURRENCY CONTROL: Serializability Theory, Taxonomy of Concurrency control Mechanisms, Lock-Based Concurrency Control, Timestamp-Based Concurrency Control, Optimistic Concurrency Control, Deadlock Management

UNIT-IV **(10 Lectures)**

PARALLEL DATABASES: Introduction to Parallel Databases, Parallel Database System Architectures, Parallel Data Placement, Full Partitioning; Parallel Query Processing, Query Parallelism; Parallel Query Optimization, Search Space, Cost Model, Search Strategy; Load Balancing.

UNIT-V **(10 Lectures)**

DISTRIBUTED OBJECT DATABASE MANAGEMENT: Fundamental Object Concepts and Object Models, Object Distribution Design, Architectural Issues, Object Management- Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Transaction Management

Text book:

1. M T Ozsu, Patrick Valduriez, Principles of Distributed Database Systems, Prentice Hall, 1999.

References:

1. S. Ceri and G. Pelaggati, Distributed Database System Principles and Systems, MGH, 1985.
2. Chanda Ray(2009), Distributed Database Systems, Pearson Education, India.

POWER ELECTRONICS
(INTERDEPARTMENTAL ELECTIVE- II)

Course Code: **A2220**

L	T	P	C
4	-	-	4

UNIT - I **(12 Lectures)**

POWER SEMI CONDUCTOR DEVICES AND COMMUTATION CIRCUITS: Thyristors - silicon controlled rectifiers (SCR's), BJT, power MOSFET, power IGBT and their characteristics, other thyristors. Basic theory of operation of SCR, static characteristics, turn on and turn off methods, dynamic characteristics of SCR, turn on and turn off times, salient points, two transistor analogy, SCR UJT firing circuit, series and parallel connections of SCR's, snubber circuit details, specifications and ratings of SCR's, BJT, IGBT numerical problems, line commutation and forced commutation circuits.

UNIT - II **(12 Lectures)**

SINGLE PHASE CONTROLLED CONVERTERS: Phase control technique, single phase line commutated converters, midpoint and bridge connections, half controlled converters, fully controlled converters with resistive, RL loads and RLE load, derivation of average load voltage and current line commutated inverters, active and reactive power inputs to the converters without and with freewheeling diode. Effect of source inductance, derivation of load voltage and current, numerical problems.

UNIT - III **(12 Lectures)**

THREE PHASE LINE COMMUTATED CONVERTERS: Three phase converters, three pulse and six pulse converters, midpoint and bridge connections average load voltage with R and RL loads, effect of source inductance, dual converters (both single phase and three phase), waveforms, numerical problems.

AC VOLTAGE CONTROLLERS: AC voltage controllers, single phase two SCR's in anti parallel with R and RL loads, modes of operation of Triac, Triac with R and RL loads, derivation of RMS load voltage, current and power factor wave forms, firing circuits, numerical problems.

UNIT - IV **(12 Lectures)**

CYCLO CONVERTERS: Cyclo converters, single phase midpoint cyclo converters with resistive and inductive load (principle of operation only), bridge configuration of single phase cyclo converter (principle of operation only), waveforms.

CHOPPERS: Time ratio control and current limit control strategies, step down choppers derivation of load voltage and currents with R, RL and RLE loads, step up chopper, load voltage expression. Morgan's chopper, jones chopper and oscillation chopper (principle of operation only) waveforms, AC chopper, problems.

UNIT - V **(12 Lectures)**

INVERTERS: Inverters, single phase inverter, basic series inverter, basic parallel capacitor inverter bridge inverter, waveforms, simple forced commutation circuits for bridge inverters, MC Murray and MC Murray, bedford inverters, voltage control techniques for inverters pulse width modulation techniques, numerical problems.

Text Books:

1. M. D. Singh, K. B. Kanchandhani (2008), *Power Electronics*, 3rd edition, Tata Mc graw hill publishing company, New Delhi.
2. M. H. Rashid (1998), *Power Electronics: Circuits, Devices and Applications*, 3rd edition, Prentice Hall of India, New Delhi.

Reference Books:

1. Vedam Subramanyam (1997), *Power Electronics*, New Age International (P) Limited, New Delhi.
2. V. R. Murthy (2005), *Power Electronics,* 1st edition, Oxford University Press, New Delhi.
3. P. C. Sen(2001), *Power Electronics*, 30th edition, Tata Mc Graw Hill Publishing, New Delhi.

VLSI DESIGN
(INTERDEPARTMENTAL ELECTIVE- II)

Course Code: **A2426**

L	T	P	C
4	-	-	4

UNIT - I **(10 Lectures)**

MOS TRANSISTOR THEORY: Introduction, MOS Device Design Equations–Threshold Voltage-Body Effect, Channel Length Modulation, MOS Models, the Complementary CMOS Inverter-DC characteristics, the differential inverter, the Tristate inverter, Bipolar devices.

UNIT - II **(10 Lectures)**

CMOS PROCESSING TECHNOLOGY: Overview-Wafer Processing, Oxidation, Epitaxy, deposition, ion-implantation and diffusion, the silicon gate process, Basic CMOS technology, Latchup – Origin of Latch up, Latch up triggering, Latch-up prevention.

UNIT - III **(14 Lectures)**

MOS-CIRCUIT DESIGN PROCESSES: MOS Layers, Stick Diagrams- nMOS Design style, CMOS design style, Design Rules and Layout-Lambda based design rules, contact cuts, double metal MOS process rules, CMOS Lambda based design rules, general observations on design rules, 2 µm Double metal Double poly CMOS rules, Layout Diagrams.

CIRCUIT CHARACTERIZATION: Introduction, Resistance Estimation, Capacitance Estimation, Inductance, Switching Characteristics-analytic delays models, Power Dissipation, Scaling of MOS Transistor Dimensions.

UNIT - IV **(12 Lectures)**

CMOS CIRCUIT DESIGN AND LOGIC DESIGN: Introduction, CMOS logic gate design, Basic Physical design of simple logic gates, CMOS logic structures-CMOS complementary logic, Pseudo-nMOS logic, Dynamic CMOS logic, Pass transistor Logic, CMOS Domino Logic.

UNIT - V **14 Lectures)**

CMOS TESTING: Need for Testing, Manufacturing Test Principles-fault models, Observability, Controllability, Design Strategies for Test, Chip Level test Techniques.

Text Books:

1. Neil H. E. Weste, Kamran Eshraghian (2001), Principles of CMOS VLSI Design – A System Perspective, 2nd Edition,Pearson Education Asia, India.
2. Kamran Eshraghian, Dougles A. Pucknell, SholehEshraghian (2005), Essentials of VLSI Circuits and Systems, PHI,New Delhi.

Reference Books:

1. John .P. Uyemura (2011), Introduction to VLSI Circuits and Systems, John Wiley, India.
2. S.M. Sze (2003), VLSI Technology, 2nd Edition, Tata McGraw Hill, New Delhi.

OPERATIONS RESEARCH
(INTERDEPARTMENTAL ELECTIVE- II)

L	T	P	C
4	-	-	4

Course Code: A2333

UNIT – I **(12 Lectures)**

INTRODUCTION TO OPERATIONS RESEARCH: Basics definition, scope, objectives, phases, models and limitations of Operations Research. Linear Programming Problem, Formulation and Graphical solution of Linear Programming Problem. Simplex Method, Artificial variables Techniques, big -M method, two -phase simplex method, degeneracy and unbound solutions.

UNIT – II **(12 Lectures)**

TRANSPORTATION PROBLEM: Formulation, solution, unbalanced transportation problem. Finding basic feasible solutions, North-West corner rule, least cost method and Vogel's approximation method. Optimality test – MODI method. **ASSIGNMENT MODEL:** Formulation, Hungarian method for optimal solution, solving unbalanced problem, Traveling salesman problem as assignment problem.

UNIT – III **(12 Lectures)**

SEQUENCING MODELS: Solution of Sequencing Problem, Processing n Jobs through two machines, Processing n Jobs through three machines, Processing two Jobs through m machines, Processing n Jobs through m Machines.

QUEUING THEORY: Introduction, Single Channel, Poisson arrivals, exponential service times with infinite population and finite population models.

UNIT – IV **(12 Lectures)**

REPLACEMENT MODELS: Replacement of Items that Deteriorate whose maintenance costs increase with time without change in the money value, Replacement of items that fail suddenly, individual replacement policy, group replacement policy. **INVENTORY MODELS:** Inventory costs, Models with deterministic demand model: (a) Demand rate uniform and production rate infinite, (b) Demand rate non-uniform and production rate infinite, (c) Demand rate uniform and production rate finite.

UNIT – V **(12 Lectures)**

GAME THEORY: Competitive game, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game. Solution of games with saddle points, dominance principle, Rectangular games without saddle point, mixed strategy for 2 X 2 games.

DYNAMIC PROGRAMMING: Characteristics of dynamic programming, Dynamic programming approach for priority management employment smoothening, Capital budgeting, Stage Coach/Shortest Path, cargo loading and Reliability problems.

Text Books:

1. M. Natarajan, P. Balasubramani, A. Tamilarasi (2006), *Operations Research*, Pearson Education, India.
2. S. D. Shama (2009), *Operation Research,* Tata McGraw Hill, New Delhi.

Reference Books:

1. J. K. Sharma (2007), *Operations Research – Theory and Applications,* 3rd edition, Macmillan India Ltd, India.
2. R. Panneerselvam (2008), *Operations Research*, 2nd edition, Prentice Hall of India, India.
3. F. S. Hillier, G. J. Lieberman (2007), *Introduction to Operations Research,* 8th edition, Tata McGraw Hill, New Delhi, India.

ROBOTICS
(INTERDEPARTMENTAL ELECTIVE – II)

Course Code: A2351

L	T	P	C
4	-	-	4

UNIT – I **(12 Lectures)**

INTRODUCTION: Automation and Robotics, CAD/CAM and Robotics, an over view of Robotics, present and future applications – classification by coordinate system and control system.

COMPONENTS OF THE INDUSTRIAL ROBOTICS: Function line diagram representation of robot arms, common types of arms. Components, Architecture, number of degrees of freedom – Requirements and challenges of end effectors, determination of the end effectors, comparison of Electric, Hydraulic and Pneumatic types of locomotion devices.

UNIT – II **(12 Lectures)**

MOTION ANALYSIS: Homogeneous transformations as applicable to rotation and translation, problems.

MANIPULATOR KINEMATICS: Specifications of matrices, D-H notation joint coordinates and world coordinates Forward and inverse kinematics, problems.

UNIT – III **(12 Lectures)**

MANIPULATOR DYNAMICS-I: Differential transformation and manipulators, Jacobians, problems. Dynamics: Lagrange, Euler and Newton, Euler formations, Problems.

MANIPULATOR DYNAMICS-II: Trajectory planning and avoidance of obstacles, path planning, Skew motion, joint integrated motion, straight line motion, Robot programming, languages and software packages.

UNIT – IV **(10 Lectures)**

ROBOT ACTUATORS AND FEEDBACK COMPONENTS: Actuators: Pneumatic, Hydraulic actuators, electric and stepper motors. Feedback components: position sensors, potentiometers, resolvers, encoders, Velocity sensors.

UNIT – V **(10 Lectures)**

ROBOT APPLICATION IN MANUFACTURING: Material Transfer, Material handling, loading and unloading, Processing spot and continuous arc welding & spray painting, Assembly and Inspection.

Text Books:

1. M. P. Groover (2010), *Industrial Robotics*, 3rd edition, Pearson Education, New Delhi.
2. K.S. Fu (2010), *Robotics*, 1st edition, Tata Mc Graw Hill Publishing Company Ltd., New Delhi.

Reference Books:

1. R.K. Mittal, I. J. Nagrath (2012), *Robotics and Control*, 1st edition, Tata Mc Graw Hill Publishing Company Ltd.,
2. New Delhi.
3. P. Coiffet, M. Chaironze (2010), *An Introduction to Robot Technology*, 3rd edition, Kogam Page Ltd., London.
4. Richard D. Klafter (2010), *Robotic Engineering*, 2nd edition, Prentice Hall of India, New Delhi.

AIR POLLUTION AND CONTROL METHODOLOGIES (INTERDEPARTMENTAL ELECTIVE-II)

Course Code: A2154

L	T	P	C
4	-	-	4

UNIT-I

AIR POLLUTION: Definition, scope, significance, air pollutants classification - natural and artificial, primary and secondary, point and non- point, line and areal, stationary and mobile sources. Effects of air pollutants on man, material and vegetation, global effects of air pollution, green house effect, heat islands, acid rains, ozone holes etc.

UNIT-II

THERMODYNAMICS AND KINETICS OF AIR - POLLUTION: Applications in the removal of gases like SOx, NOx, CO, HC etc., air-fuel ratio. Computation and Control of products of combustion. Meteorology and plume Dispersion,

UNIT-III

PROPERTIES OF ATMOSPHERE: Heat, Pressure, Wind forces, Moisture and relative Humidity, Influence of Meteorological phenomena on Air Quality-wind rose diagrams.

LAPSE RATES: Pressure Systems, Winds and moisture plume behavior and plume Rise Models; Gaussian Model for Plume Dispersion.

UNIT-IV

CONTROL OF PARTICULATES: Control at Sources, Process Changes, Equipment modifications, Design and operation of control. Equipment's – Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators. General Methods of Control of NOx and Sox emissions, In-plant Control Measures, process changes, dry and wet methods of removal and recycling.

UNIT -V

AIR QUALITY MANAGEMENT: Monitoring of SPM, SO; NO and CO Emission Standards.

TEXT BOOKS:

1. M. N. Rao, H. V. N. Rao (1988), *Air pollution*, Tata McGraw Hill Education, New Delhi, India.
2. C. S. Rao (2006), *Environmental Pollution control Engineering*, New age international, New Delhi, India.

REFERENCE BOOKS:

1. R. K. Trivedy, P.K. Goel (2003), *Introduction to Air pollution*, ABD Publications, New Delhi, India.
   Wark, Warner (1998), *Air pollution its origin and control,* Addison-Wesley, New York.

RATIONAL APPLICATION DEVELOPER
(PROFESSIONAL ELECTIVE- I)

Course Code: **A2525**

L	T	P	C
3	1	-	4

UNIT – I **(14 Lectures)**

WORKBENCH BASICS: Set Workbench preferences, Work with perspectives and views, Use the import and export wizards, Use the Help feature to aid in development activities, Use the Local History to compare and replace resources, Manage workspaces.

JAVA DEVELOPMENT: Create Java projects packages, classes, and methods, Manage the Java Build Path, Use the Outline view, Use the refactoring features, Use the Java editor features such as content assist and code formatting, Add and organize import declarations, Use the Java search function, Use the Task and Problems views, Use the Hierarchy view, Use the resource and project property dialogues.

UNIT – II **(12 Lectures)**

WEB DEVELOPMENTBASICS: Create dynamic and static Web projects, Understand classpath and module dependencies, Use Page Designer to add and modify HTML, JavaScript, and JSP content, Configure Web project properties, Create and configure Servlets.

UNIT – III **(12 Lectures)**

RUNNING APPLICATIONS: Use WebSphere Application Server V6 to run J2EE applications, Create and configure data sources, Add and remove projects from the server, Run stand-alone Java applications, Locate and viewWebSphere application server logs.

DATABASES: Create a database connection, use the SQL Statement wizard, and sample contents of a database table.

UNIT– IV **(10 Lectures)**

WEB DEVELOPMENT - ADVANCE: Understand the available Struts development tools, understand the available JSF (JavaServer Faces) development tools.

PACKAGING AND DEPLOYMENT: Create J2EE projects, Import and export J2EE modules, Create and locate resources in the appropriate location of the project hierarchy, Work with Web and Application Deployment Descriptor Editors.

UNIT – V **(10 Lectures)**

DEBUGGING WEB APPLICATION: Perform JSP debugging, Use step-by-step debugging.
TEST WEB APPLICATION: Perform unit testing using Junit, Perform Web Application testing.

TEXT BOOKS:

1. UeliWahli (2010), *Rational Application Developer V7.5 Programming Guide*, 1st edition, Redbooks, SPD, New Delhi, India

REFERENCE BOOKS:

1. Jane Fung, Christina Lau, Ellen McKay, Valentina Birsan, Colin Yu, Joe Winchester, Dr. Gili Mendel, Gary Flood , Peter Walker, Timothy deBoer, Yen Lu, James Hunter(2005), *An Introduction to IBM Rational Application Developer: A Guided Tour (Ibm Illustrated Guide Series)*, Mc Press, IBM Press, USA.
2. Colette Burrus, Stephanie Parkin (2008), *Building Applications with IBM Rational Application Developer and JavaBeans*, 2nd edition, Mc Press, IBM Press, USA.

DISTRIBUTED OPERATING SYSTEMS
(PROFESSIONAL ELECTIVE- I)

Course Code: **A2527**

L	T	P	C
3	1	-	4

UNIT –I **(12 Lectures)**

INTRODUCTION TO DISTRIBUTED SYSTEMS: What is a Distributed System? Hardware concepts, software concepts, design issues.

UNIT –II **(12 Lectures)**

Communication in Distributed Systems, Layered Protocols, ATM networks, The client –server model, remote procedure call, group communication.

UNIT –III **(13 Lectures)**

SYNCHRONIZATION IN DISTRIBUTED SYSTEM: Clock synchronization, mutual exclusion, election algorithms, atomic transactions, deadlocks in distributed systems.

UNIT –IV **(13 Lectures)**

PROCESS AND PROCESSORS IN DISTRIBUTED SYSTEM: Threads, system models, processors allocation, scheduling in distributed system, fault tolerance, real time distributed system

Distributed File Systems: Distributed file system design, distributed file system implementation, trends in distributed file system.

UNIT –V **(13 Lectures)**

DISTRIBUTED SHARED MEMORY: Introduction, What is Shared memory? Consistency models, page based distributed shared memory, shared – variable distributed shared memory, object based distributed shared memory.

Text Books:

1. Distributed Operating Systems (2007), Andrew S. Tanenbanm, Pearson Education, Inc.

Reference Books:

1. Advanced Concepts in Operating Systems, Makes Singhal and Niranjan G. Shivaratna.

IV Year B. Tech IT - VII Semester

COMPUTER GRAPHICS
(PROFESSIONAL ELECTIVE -I)

Course Code: A2614

L	T	P	C
3	1	-	4

UNIT - I **(10 Lectures)**

INTRODUCTION: Application areas of computer graphics, overview of graphics systems, video-display devices and raster-scan systems, random scan systems, graphics monitors, work stations and input devices, graphics standards.

UNIT - II **(08 Lectures)**

OUTPUT PRIMITIVES: Points and lines, Line drawing, Midpoint circle and Ellipse Algorithms. Filled area primitives - scan line polygon fill algorithm, boundary fill and flood fill algorithms.

UNIT - III **(10 Lectures)**

2D - GEOMETRICAL TRANSFORMS: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

2D - VIEWING: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland–Hodgeman polygon clipping algorithm.

UNIT - IV **(11 Lectures)**

3D - GEOMETRIC TRANSFORMATIONS: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3D - VIEWING: Viewing pipeline, viewing coordinates, view volume and general projection transforms 3D-clipping.

3D - OBJECT REPRESENTATION: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-spline curves, Bezier and B-spline surfaces.

UNIT - V **(10 Lectures)**

VISIBLE SURFACE DETECTION METHODS: classifications, back face detection, depth buffer, scan line and depth sorting.

COMPUTER ANIMATION: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

TEXT BOOKS:

1. Donald Hearn, M. Pauline Baker, Warren Carithers(2014), “Computer Graphics with Open GL”, 4th Edition, Pearson Education, India.
2. Donald Hearn, M. Pauline Baker (2011), “Computer Graphics with Open GL”, 3rd edition, Pearson Education, India.

REFERENCE BOOKS:

1. David F. Rogers (1998), Procedural elements for Computer Graphics, 2nd edition, Tata Mc Graw Hill, New Delhi, India.
2. Steven Harrington (1987), Computer Graphics, 2nd edition, Tata Mc Graw Hill, New Delhi, India.
3. Zhig and xiang, Roy Plastock (2000), Computer Graphics, 2 nd edition, Schaum’s outlines, Tata Mc Graw Hill Edition, USA.

BUILDING ENTERPRISE APPLICATIONS
(PROFESSIONAL ELECTIVE –I)

Course Code: **A2615**

L	T	P	C
3	1	-	4

UNIT - I **(10 Lectures)**

INTRODUCTION: enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications.

UNIT - II **(10 Lectures)**

INCEPTION OF ENTERPRISE APPLICATIONS: enterprise analysis, business modelling, requirements elicitation, use case modeling, prototyping, non functional requirements, requirements validation, planning and estimation.

UNIT - III **(14 Lectures)**

ARCHITECTING AND DESIGNING ENTERPRISE APPLICATION: Concept of Architecture, Views and Viewpoints, Enterprise Architecture, Logical Architecture, Technical Architecture – Design, different Technical Layers, Best Practices, Data Architecture and Design – Relational, XML, and other Structured Data Representations, Infrastructure Architecture and Design Elements – Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of Application Architecture and Design.

UNIT - IV **(14 Lectures)**

CONSTRUCTING ENTERPRISE APPLICATIONS: Construction readiness of Enterprise Applications – defining a Construction Plan, defining a Package Structure, Setting up a Configuration Management Plan, Setting up a Development Environment, Introduction to the concept of Software Construction Maps, Construction of Technical Solutions Layers, Methodologies of Code Review, Static Code Analysis, Build Process and Unit Testing, Dynamic Code Analysis – Code Profiling and Code Coverage.

UNIT - V **(12 Lectures)**

TESTING ROLLING OUT ENTERPRISE APPLICATIONS: Type and methods of testing an Enterprise Application, Testing Levels and Approaches, Enterprise Application Environments, Integration Testing, Performance Testing, Penetration Testing, Usability Testing, Globalization Testing and Interface Testing, User Acceptance Testing, Rolling out an Enterprise Application.

Text Books:

1. Anubhav Pradhan, SathReesha B. Nanjappa, Senthil K. Nallasamy, eeraKumar Esakimuthu(2010), Raising Enterprise Applications: A Software Engineering Perspective, Wiley India Pvt Ltd, India.
2. Building Java Enterprise Applications– Published by O'Reilly Media, authored by Brett McLaughlin

Reference Books:

1. Raffaele Garofalo(2011), Building Enterprise Applications with Windows® Presentation Foundation and the Model View View Model Pattern , O'Reilly Media, Inc, India.
2. Software Requirements: Styles & Techniques– published by Addison-Wesley Professional
3. Software Systems Requirement s Engineering: In Practice – published by McGraw-Hill/Osborne Media
4. Managing Software Requirements: A Use Case Approach, 2/e – published by Pearson
5. Software Architecture: A Case Based Approach – published by Pearson

IMAGE PROCESSING AND PATTERN RECOGNIZATION
(PROFESSIONAL ELECTIVE- I)

Course Code: **A2616**

L	T	P	C
3	1	-	4

UNIT – I **(15 Lectures)**

FUNDAMENTALS OF IMAGE PROCESSING: Image acquisition, image model, sampling, quantization, relationship between pixels, distance measures, connectivity, image geometry, photographic film.

IMAGE TRANSFORMS: A detail discussion on Fourier transform, DFT, FFT, properties. A brief discussion on WALSH transform, WFT, HADAMARD transform, DCT.

UNIT – II **(16 Lectures)**

IMAGE ENHANCEMENT (by SPATIAL Domain Methods): Histogram Processing - definition, equalization, matching, local enhancement, use of histogram statics for image enhancement, Arithmetic and logical operations, pixel or point operations, size operations, Smoothing filters-mean, median, mode filters, sharpening spatial filtering.

IMAGE ENHANCEMENT (by FREQUENCY Domain Methods): Design of low pass, high pass, edge enhancement, smoothening filters in frequency domain. Butter worth filter, sharpening frequency domain filters, homomorphic filters in frequency domain.

UNIT – III **(12 Lectures)**

IMAGE COMPRESSION: Fundamentals, image compression models, elements of information theory, error-free compression, lossy compression, image compression standards.

UNIT – IV **(10 Lectures)**

IMAGE SEGMENTATION: Detection of discontinuities, edge linking and boundary detection, thresholding, region based segmentation, segmentation by morphological watersherds, the use of motion in segmentation.

UNIT – V **(12 Lectures)**

PATTERN RECOGNITION: Introduction, Probability, Statistical decision making, Nonparametric decision making, Clustering, Processing of waveforms, Image analysis.

Text Books:

1. Rafael C. Gonzalez, Richard E. Woods (2008), *Digital Image Processing*, Low Price Edition, Pearson Education, New Delhi, India.
2. Pattern Recognition, Pau & Gonzalez

Reference Books:

1. Arthur R. Weeks (1996), *Fundamentals of Electronic Image Processing*, Prentice Hall of India, New Delhi.
2. Milan Sonka, Vaclav Hlavac, Roger Boyle (2008), *Image processing, Analysis and Machine vision*, Thomson Publications, India.

BIOINFORMATICS
(PROFESSIONAL ELECTIVE- I)

Course Code: **A2617**

L	T	P	C
3	1	0	4

UNIT-I **(12 Lectures)**

INTRODUCTION TO BIOINFORMATICS: Scope of Bioinformatics, Elementary commands and protocols, ftp, telnet, http, Primer on information theory.

Introduction to Homology: Introduction to Homology (with special mention to Charles Darwin, Sir Richard Owen, Willie Henning, Alfred Russel Wallace).

UNIT-II **(12 Lectures)**

SPECIAL TOPICS IN BIOINFORMATICS: DNA mapping and sequencing, Map alignment, Large scale sequencing methods, Shotgun and Sanger method.

SEQUENCING ALIGNMENT AND DYNAMIC PROGRAMMING: Heuristic Alignment algorithms, Global sequence alignments, Neddleman-Wunsch algorithm, Smith-Waterman algorithm, Local sequence alignments (Amino acid substitution Matrices (PAM, BLOSUM)).

UNIT-III **(10 Lectures)**

PRIMARY DATABASE AND THEIR USE: Introduction to Biological databases, Organization and management of databases, Searching and retrieval of information from the World Wide Web.

STRUCTURED DATABASES: Protein Data Bank (PDB), Molecular Modelling Databases (MMDB).

UNIT-IV **(10 Lectures)**

PRIMARY DATABASES: NCBL, EMBL, DDBJ.

SECONDARY DATABASES: Introduction to Secondary databases, Organization and management of databases: Swissport, PIR, KEGG.

UNIT-V **(10 Lectures)**

BIO-CHEMICAL DATABASES: Introduction to biochemical databases, Organization and management of databases: KEGG, EXGESCY, BRENDA, WIT.

EVOLUTIONARY TREES AND PHYLOGENY: Multiple sequence alignment and phylogenetic analysis.

Text Books:

1. Bioinformatics Basics. Applications in Biological Science and Medicine by Hooman H. Rashidi and Lukas K. Buehler CAC Press 2000.
2. Algorithms on Strings Trees and Sequences Dan Gusfiled. Cambridge University Press 1988.

Reference Books:

1. Bioinformatics: A machine Learning Approach P. Baldi. S. Brunak, MIT Press 1988.
2. Bioinformatics, David Mount, 2000. CSH Publications.
3. Developing Bioinformatics Skills, Cynthia Gibbas & Per Jamberk.
4. Genomics and Proteomics – Functional and Computational aspects. Springer Publications.
5. Bioinformatics – Methods and Protocols – Human Press. Stephen Misener, Stephen A. Krawetz.
6. Computational Biochemistry – C. Stan, TSAI WILEY Publications.
7. Bioinformatics: A practical guide to the analysis of Genes and Proteins – ANDREAS D.BAXEVANIS, B.F. FRANCIS OUELLETTE.
8. Bioinformatics- Principle and Applications – Harshawardhan P. Bal TATA MEGRAW HILL.

GRID COMPUTING
(PROFESSIONAL ELECTIVE –II)

Course Code: **A2530**

L	T	P	C
3	1	0	4

UNIT- I **(10 Lectures)**

CONCEPTS AND ARCHITECTURE: Introduction, Parallel and Distributed Computing, Cluster Computing, Grid Computing, Anatomy and Physiology of Grid, Review of Web Services – OGSA, WSRF

UNIT- II **(10 Lectures)**

GRID MONITORING: Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- Grid ICE – JAMM – MDS - Network Weather Service - R-GMA - Other Monitoring Systems - Ganglia and GridMon

UNIT- III **(10 Lectures)**

GRID SECURITY AND RESOURCE MANAGEMENT: Grid Security - A Brief Security Primer - PKI-X509 Certificates, Grid Scheduling and Resource Management, Scheduling Paradigms, Working principles of Scheduling - A Review of Condor, SGE, PBS and LSF - Grid Scheduling with QOS.

UNIT- IV **(10 Lectures)**

DATA MANAGEMENT AND GRID PORTALS: Data Management- Categories and Origins of Structured Data - Data Management Challenges-Architectural Approaches - Collective Data Management Services - Federation Services - Grid Portals - First-Generation Grid Portals - Second-Generation Grid Portals

UNIT- V **(10 Lectures)**

GRID MIDDLEWARE: List of globally available middleware, Case Studies, Recent version of Globus Toolkit and gLite, Architecture, Components and Features.

Text Books:

1. Maozhen Li, Mark Baker, The Grid Core Technologies, John Wiley & Sons, 2005.
2. Ian Foster & Carl Kesselman, The Grid 2 – Blueprint for a New Computing Infrascture, Morgan Kaufman – 2004

Reference Books:

1. Joshy Joseph & Craig Fellenstein, “Grid Computing”, Pearson Education 2004.
2. Fran Berman, Geoffrey Fox, Anthony J.G.Hey, “Grid Computing: Making the Global Infrastructure a reality”, John Wiley and sons, 2003.

BIG DATA
(PROFESSIONAL ELECTIVE- II)

Course Code: **A2621**

L	T	P	C
3	1	-	4

UNIT – I **(12 Lectures)**

Big Data, Complexity of Big Data, Big Data Processing Architectures, Big Data Technologies, Big Data Business Value, Data Warehouse, Re-Engineering the Data Warehouse, Workload Management in the Data Warehouse, New Technology Approaches.

UNIT – II **(12 Lectures)**

Integration of Big Data and Data Warehouse, Data Driven Architecture, Information Management and Lifecycle, Big Data Analytics, Visualization and Data Scientist, Implementing The "Big Data" Data. Choices in Setting up R for Business Analytics, R Interfaces, Manipulating Data, Exploring Data, Building Regression Models, Clustering and Data Segmentation, Forecasting and Time Series Models.

UNIT – III **(12 Lectures)**

Writing Hadoop Map Reduce Programs, Integrating R and Hadoop, Using Hadoop Streaming with R, Learning Data Analytics with R and Hadoop, Understanding Big Data Analysis with Machine Learning. Big Data, Web Data, A Cross-Section of Big Data Sources and the Value They Hold, Taming Big Data, The Evolution of Analytic Scalability.

UNIT – IV **(10 Lectures)**

The Evolution of Analytic Processes, the Evolution of Analytic Tools and Methods. Legacy Data, Hypothesis Testing, Prediction, Software, Complexity, Business problems suited to big data analytics.

UNIT – V **(10 Lectures)**

High Performance Appliances for Big Data Management, Using Graph analytics, The New Information Management Paradigm, Big Data's Implication for Businesses, Big Data Implications for Information Management, Splunk's Basic Operations on Big Data.

Text Books:

1. Data Warehousing in the Age of Big Data by Krish Krishnan, Morgan Kaufmann.
2. A.Ohri, “R for Business Analytics”, Springer, 2012.

Reference Books:

1. Big Data Analytics with R and Hadoop by VigneshPrajapati.
2. Principles of Big Data Preparing, Sharing, and Analyzing Complex Information, 1st Edition, by J Berman, published by Morgan Kaufmann.
3. “Big Data Analytics - From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph” By David Loshin, Morgan Kaufmann.
4. Big Data Imperatives: Enterprise 'big Data' Warehouse, 'BI' Implementations and Analytics by SoumendraMohanty, Apress.
5. Big Data Analytics Using Splunk By Peter Zadrozny , Raghu Kodali, Apress 2013.
6. Franks, Bill, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, Wiley, 1st Edition, 2012.

SERVICE ORIENTED ARCHITECTURE
(PROFESSIONAL ELECTIVE- II)

Course Code: **A2622**

L	T	P	C
3	1	-	4

UNIT – I **(13 Lectures)**

SOA AND WEB SERVICES FUNDAMENTALS: Introducing SOA, Fundamental SOA, Common Characteristics of Contemporary SOA, Common tangible benefits of SOA, The roots of SOA, Web Services and primitive SOA, The Web Services frame work, Services, Service descriptions, Messaging.

UNIT – II **(13 Lectures)**

SOA AND WS--* EXTENSIONS: Web Services and Contemporary SOA (Part-I: Activity management and Composition), Message exchange patterns, Service Activity Coordination, Atomic transactions, Business Activities, Orchestration, Choreography. Web Services and Contemporary SOA (Part-II: Advanced Messaging, Metadata, and Security), Addressing, Reliable messaging, Correlation, Policies, Metadata exchange, Security, Notification and eventing.

UNIT – III **(13 Lectures)**

SOA AND SERVICES ORIENTATION: Principles of Service Orientation, Service Orientation and the enterprise, Anatomy of SOA, Common Principles of Service Orientation, interrelation between Principles of Service Orientation.
SERVICE LAYERS: Service Orientation and Object Orientation, Native Web Services support for principles of Service Orientation, Service Layers, Business Service Layer, Orchestration Service Layer, Agnostics Services, Service Layer Configuration Scenarios.

UNIT – IV **(13 Lectures)**

BUILDING SOA (PLANNING AND ANALYSIS): SOA Delivery Strategies, SOA delivery lifecycle phases, the top down strategy, the bottom up strategy, the agile strategy Service, Oriented Analysis (Part-I: Introduction) – Introduction to Service Oriented Analysis, Benefits of a Business Centric SOA, Deriving Business Services. Service Oriented Analysis(Part-II: Service Modeling) – Service Modeling, Service Modeling guidelines, Classifying Service model logic, Contrasting Service modeling approaches.

UNIT – V **(13 Lectures)**

BUILDING SOA (TECHNOLOGY AND DESIGN): Service Oriented Design (Part-I: Introduction) – Introduction to Service Oriented design, WSDL related XML Schema language basics, WSDL language basics, Service interface design tools, Service – Oriented Design (Part- II: SOA Composition Guidelines) – SOA composing steps, Considerations for choosing service layers, Considerations for positioning core SOA standards, Considerations for choosing SOA extensions. Service Oriented Design (part- III: Service Design) – Service Design Overview, Service Design guidelines Service Oriented Design (Part-IV: Business Process Design). WS-BPEL Extensions, WS Coordination overview, Service Oriented Business process Design. Fundamental WS- * extensions, SOA Platforms – SOA platform basics, SOA support in J2EE and .NET, Integration considerations.

Text Books:

1. Thomas Erl (2005), *Service Oriented Architecture – Concepts, Technology and Design*, Pearson Education, South Asia.

Reference Books:

1. Jeff Davies & others (2008), *The Definitive guide to SOA*, Dreamtech, India.
2. N. M. Josuttis (2007), *SOA in Practice*, SPD, O'Reilly Media, Inc, India.
3. Shankar. K(2008) , SOA for Enterprise Applications, Wiley India Edition, India.
4. Eric Newcomes, Greg Lomow (2005), *Understanding SOA with Web Services*, Pearson Education, India.

GEOGRAPHICAL INFORMATION SYSTEMS

(PROFESSIONAL ELECTIVE- II)

Course Code: **A2623**

L	T	P	C
3	1	0	4

UNIT-I **(12 Lectures)**

SPACE AND TIME IN GIS- Space, time, geography, Geography and GIS, Arguments, debates and dialogues: the GIS–social theory debate and the concern for alternatives, Spatial representation: the scientist's perspective, Spatial representation: the social scientist's perspective, Spatial representation: a cognitive view, Time in GIS and geographical databases, Representation of terrain, Generalizing spatial data and dealing with multiple representations, Visualizing spatial distributions. **DATA QUALITY-** Data quality parameters, Models of uncertainty in spatial data, Propagation of error in spatial modeling with GIS, Detecting and evaluating errors by graphical methods.

UNIT-II **(12 Lectures)**

SPATIAL ANALYSIS- Spatial statistics, Interactive techniques and exploratory spatial data analysis, Applying geocomputation to the analysis of spatial distributions, Spatial analysis: retrospect and prospect, Location modeling and GIS. **GIS ARCHITECTURE ISSUES-** New technology and GIS, GIS in networked environments, Desktop GIS software, GIS interoperability, GIS customization. **SPATIAL DATABASES-** Relational databases and beyond, Spatial access methods, Interacting with GIS, Principles of spatial database analysis and design.

UNIT-III **(12 Lectures)**

TECHNICAL ASPECTS OF GIS DATA COLLECTION- Spatial referencing and coordinate systems, Encoding and validating data from maps and images, Digital remotely-sensed data and their characteristics, Using GPS for GIS data capture.

DATA TRANSFORMATION AND LINKAGE- Spatial interpolation, Multi-criteria evaluation and GIS, Spatial tessellations, spatial hydrography and landforms, Intervisibility on terrains, Virtual environments and GIS, The future of GIS and spatial analysis.

MAKING THE GIS EFFICIENT, EFFECTIVE, AND SAFE TO USE- Choosing a GIS , Measuring the benefits and costs of GIS , Managing an operational GIS, Institutional consequences of the use of GIS , Managing uncertainty in GIS,Liability in the use of GIS and geographical datasets.

UNIT-IV **(12 Lectures)**

DATA AS A MANAGEMENT ISSUE- Characteristics and sources of framework data, Characteristics, sources, and management of remotely-sensed data, Metadata and data catalogues, National and international data standards.

GIS AS A MANAGEMENT TOOL- GIS for business and service planning, Managing public discourse: towards the augmentation of GIS with multimedia, managing a whole economy: the contribution of GIS.

THE IMPACT OF BROAD SOCIETAL ISSUES ON GIS- Enabling progress in GIS and education, Rethinking privacy in a geocoded world , National and international geospatial data policies.

UNIT-V **(12 Lectures)**

OPERATIONAL APPLICATIONS- GIS in the utilities, IS in telecommunications, Transportation GIS: GIS-T , GIS in emergency management, IS in land administration , Urban planning and GIS, Military applications of GIS , Applying GIS in libraries.

SOCIAL AND ENVIRONMENTAL APPLICATIONS- The rebuilding of a country: the role of GIS in South Africa , Health and health care applications , GIS and the geography of politics , Monitoring land cover and land-use for urban and regional planning , GIS and landscape conservation, Local, national, and global applications of GIS in agriculture , GIS in environmental monitoring and assessment ,Epilogue .

Text Books:

1. Longley P.A., M.F. Goodchild, D.J. Maguire, D.W. Rhind, 2011.Geographic Information Systems and Science. John Wiley and Sons, New Jersey, 517 p.

Reference Books:

1. Chang, K.T., 2012. Introduction to Geographic Information Systems (Sixth Edition). McGraw Hill, New York, 418 p.
2. de Smith, M., Goodchild, M., Longley, P., 2013. Geospatial Analysis: A Comprehensive Guide (www.spatialanalysisonline.com)

HUMAN COMPUTER INTERACTION

(PROFESSIONAL ELECTIVE- II)

Course Code: **A2624**

L	T	P	C
3	1	-	4

UNIT – I **(12 Lectures)**

INTRODUCTION: Importance of user Interface – definition, importance of good design, benefits of good design. A brief history of Screen design.

THE GRAPHICAL USER INTERFACE – Popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics, Principles of user interface.

UNIT – II **(12 Lectures)**

DESIGN PROCESS – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds and understanding business junctions.

UNIT – III **(12 Lectures)**

SCREEN DESIGNING : Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow, Visually pleasing composition, amount of information – focus and emphasis – presentation information simply and meaningfully, information retrieval on web – statistical graphics, Technological consideration in interface design.

UNIT – IV **(12 Lectures)**

WINDOWS – New and Navigation schemes selection of window, selection of devices based and screen based controls.

UNIT – V **(12 Lectures)**

COMPONENTS – Text and messages, Icons and images – Multimedia, colors – uses, problems with choosing colors.

INTERACTION DEVICES – Keyboard and function keys, pointing devices, speech recognition digitization and generation, image and video displays, drivers.

Text books:

1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamaTech.

Reference Books:

1. Designing the user interface,3rd Edition, Ben Shneidermann, Pearson Education Asia.
2. Human Computer Interaction,Alan Dix, Janet Fincay, Gre Goryd,Abowd, Russell Bealg, Pearson Education.

MULTIMEDIA AND RICH INTERNET APPLICATIONS

(PROFESSIONAL ELECTIVE- II)

Course Code: **A2625**

L	T	P	C
3	1	-	4

UNIT-I **(12 Lectures)**

INTRODUCTION TO MULTIMEDIA- Internet and Multimedia communications, Multimedia Networks, Multimedia Applications, Multimedia Information representation- Digitization Principles,Text,Images,Audio and Video, Compression Methods-Basic Coding Methods – Run Length coding, Huffman coding, Arithmetic coding, Discrete Cosine Transform, Differential PCM, Motion Compensated Prediction, Video Compression – JPEG, H.261, MPEG-1 Video, MPEG-2 and 3 Video, H.263, Wavelet and Fractal Image Compression, Audio Compression.

UNIT –II **(12 Lectures)**

MULTIMEDIA APPLICATIONS IN NETWORKS- Introduction, Application Level Framing, Audio/Video Conferencing-Session Directories, Audio/Video Conferencing, Adaptive Applications, Reciever Heterogeneity, Real Time Application with Resource Reservation ,Video Server, Applications requiring reliable multicast – White Board , Network Text Editor for Shared Text Editing, Multi Talk, Multicast file transfer, Multimedia Applications on the World Wide Web – Multicast Web Page Sharing, Audio/Video Streams in the www, Interactive Multiplayer Games.

UNIT –III **(12 Lectures)**

WEB 2.0 - What is web 2.0, Search, Content Networks, User Generated Content, Blogging, Social Networking, Social Media, Tagging, Social Marking, Rich Internet Applications, Web Services, Mashups, Location Based Services, XML, RSS, Atom, JSON, and VoIP, Web 2.0 Monetization and Business Models, Future of the Web.

UNIT- IV **(12 Lectures)**

RICH INTERNET APPLICATIONS(RIAS) WITH ADOBE FLASH AND FLEX- Adobe Flash- Introduction, Flash Movie Development, Learning Flash with Hands-on Examples, Publish your flash movie, Creating special effects with Flash, Creating a website splash screen, action script, web sources. Adobe Flex 2- Introduction, Flex Platform Overview, Creating a Simple User Interface, Accessing XML data from your application, Interacting with Server Side Applications, Customizing your User Interface, Creating Charts and Graphs, Connection Independent RIAs on the desktop, Adobe Integrated Runtime(AIR), Flex 3 Beta.

UNIT-V **(12 Lectures)**

AJAX- ENABLED RICH INTERNET APPLICATION - Introduction, Traditional Web Applications vs. Ajax Applications, Rich Internet Application with Ajax, History of Ajax, Raw Ajax example using xml http request object, Using XML, Creating a full scale Ajax Enabled application, Dojo Toolkit.

Text Books:

1. Multimedia Communications: Protocols and Applications , Franklin F Kuo, J.Joaquin Garcia , Wolf gang Effelsberg,Prentice Hall Publications.
2. Multimedia Communications: Applications, Networks, Protocols and Standards , Fred Halsall,Addison Wesley Publications.
3. AJAX, Rich Internet Applications, and Web Development for Programmers, Paul J Deitel and Harvey M Deitel,Deitel Developer Series,Pearson education.

Reference Books:

1. Professional Adobe Flex 2 , Rich Tretola , Simon barber and Renaun Erickson,Wrox,Wiley India Edition.
2. Multimedia Information Networking , Nalin K Sharda,PHI Learning.

SOFT COMPUTING
(PROFESSIONAL ELECTIVE- III)

Course Code: A2536

L	T	P	C
3	1	0	4

UNIT –I **(10 Lectures)**

BASICS OF ARTIFICIAL NEURAL NETWORK: Characteristics of Neural Networks, Structure and working of a biological neural network, artificial neural network: terminology, models of neurons: McCulloch Pitts model, Perceptron model, Adaline model, topology, Basic learning laws.

FUNCTIONAL UNITS FOR ANN FOR PATTERN RECOGNITION TASK: Pattern recognition problem, Basic functional units, PR by functional units

UNIT –II **(10 Lectures)**

FEED FORWARD NEURAL NETWORKS: SUPERVISED LEARNING - I: Perceptrons - Learning and memory, Learning algorithms, Error correction and gradient decent rules, Perceptron learning algorithms.

SUPERVISED LEARNING - II: Back propagation, Multilayered network architectures, Back propagation learning algorithm, Example applications of feed forward neural networks.

UNIT –III **(13 Lectures)**

FEEDBACK NEURAL NETWORKS & SELF ORGANIZING FEATURE MAP: Introduction, Associative learning, Hopfield network, Error performance in Hopfield networks, simulated annealing, Boltzmann machine and Boltzmann learning, state transition diagram and false minima problem, stochastic update, simulated annealing, Boltzmann machine bidirectional associative memory, bam stability analysis. Self organization, generalized learning laws, competitive learning, vector quantization, self organizing feature map, applications of self organizing feature map.

UNIT –IV **(11 Lectures)**

FUZZY LOGIC: Fuzzy set theory, crisp sets, operations on crisp set, fuzzy sets, fuzzy versus crisp, operations, fuzzy relations, crisp relations, properties. Fuzzy logic Application: Fuzzy Control of Blood Pressure.

UNIT –V **(10 Lectures)**

FUZZY LOGIC IN DATABASE AND INFORMATION SYSTEMS: Fuzzy Information, Fuzzy Logic in database Systems, Fuzzy Relational data Models, operations in Fuzzy Relational data Models, Design theory for Fuzzy Relational databases, Fuzzy information Retrieval and Web search, Fuzzy Object Oriented databases.

GENETIC ALGORITHMS: Introduction to Genetic Algorithms, Evolutionary Algorithms.

Text Books:

1. Satish Kumar (2004), Neural Networks A classroom Approach Tata McGraw Hill Publication, New Delhi.
2. Lotfi A. Zadeh (1997), Soft computing and Fuzzy Logic, World Scientific Publishing Co., Inc. River Edge, NJ, USA.

Reference Books:

1. B. Yegnanarayana (2006), Artificial Neural Networks, Prentice Hall of India, New Delhi, India.
2. John Yen, Reza Langari (2006), Fuzzy Logic, Pearson Education, New Delhi, India.
3. S. Rajasekaran, Vijaylakshmi Pari (2003), Neural networks, Fuzzy Logic and Genetic Algorithms Synthesis and Applications, Prentice Hall of India, New Delhi, India.

INFORMATION RETRIEVAL SYSTEMS

Course Code: A2626 **(Professional Elective – III)**

L	T	P	C
3	1	0	4

UNIT - I **(10 Lectures)**

INTRODUCTION TO INFORMATION RETRIEVAL SYSTEMS: Definition, Objectives, Functional Overview, Relationship to Database Management Systems, Digital Libraries and Data Warehouses.

INFORMATION RETRIEVAL SYSTEM CAPABILITIES: Search, Browse and Miscellaneous

UNIT - II **(12 Lectures)**

CATALOGING AND INDEXING: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

DATA STRUCTURES: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hidden Markov Models.

AUTOMATIC INDEXING: Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing, Hypertext Linkages.

UNIT - III **(14 Lectures)**

DOCUMENT AND TERM CLUSTERING: Introduction, Thesaurus Generation, Item Clustering, Hierarchy of Clusters.

USER SEARCH TECHNIQUES: Search Statements and Binding, Similarity Measures and Ranking, Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches of Boolean Systems, Searching the Internet and Hypertext.

INFORMATION VISUALIZATION: Introduction, Cognition and Perception, Information Visualization Technologies.

UNIT - IV **(12 Lectures)**

TEXT SEARCH ALGORITHMS: Introduction, Software Text Search Algorithms, Hardware Text Search Systems.

INFORMATION SYSTEM EVALUATION: Introduction, Measures used in System Evaluation, Measurement Example -TREC results.

UNIT - V **(10 Lectures)**

MULTIMEDIA INFORMATION RETRIEVAL: Models and Languages, Data Modeling Query Languages, Indexing and Searching.

LIBRARIES AND BIBLIOGRAPHICAL SYSTEMS: Online IR Systems, OPACs, Digital Libraries.

Text Books:

1.Gerald J. Kowalski, Mark T. Maybury (2000), Information Storage and Retrieval Systems: Theory and Implementation , 2nd edition, Springer International Edition, USA.

2.Ricardo Baeza Yates, Berthier Ribeiro Neto (2009), Modern Information RetrieVal , Pearson Education, India.

Reference Books:

1.Robert R. Korfhage (1997), Information Storage and Retrieval,John Wiley & Sons, India Edition, India.

2. Frakes W. B, Ricardo Baeza Yates (1992), Information Retrieval Data Structures and Algorithms ,Pearson Education / Prentice Hall of India, New Delhi, India

SEMANTIC WEB AND SOCIAL NETWORKS
(PROFESSIONAL ELECTIVE –III)

Course Code: **A2627**

L	T	P	C
3	1	0	4

UNIT - I **(8 Lectures)**

WEB INTELLIGENCE: Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of today's Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee WWW, Semantic Road Map, Logic on the semantic Web.

UNIT - II **(13 Lectures)**

KNOWLEDGE REPRESENTATION FOR THE SEMANTIC WEB: Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web -Resource Description Framework(RDF) / RDF Schema, Ontology Web Language (OWL), UML, XML/XML Schema.

UNIT - III **(13 Lectures)**

ONTOLOGY ENGINEERING: Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.

LOGIC, RULE AND INFERENCE: Logic and inference, Monotonic and Non monotonic rules, Description logic, Inference engines, RDF Interface engine.

UNIT - IV **(10 Lectures)**

SEMANTIC WEB APPLICATIONS, SERVICES AND TECHNOLOGY: Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base, XML Based Web Services, Next generation web services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods.

UNIT - V **(10 Lectures)**

SOCIAL NETWORK ANALYSIS AND SEMANTIC WEB: What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis - Electronic Discussion networks, Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

Text Books:

1. Berners Lee, Godel, Turing, H. Peter Alesso Craig F. Smith (2009), Thinking on the Web, Wiley interscience.
2. Peter Mika (2007), Social Networks and the Semantic Web, Springer, USA.

Reference Books:

1. J. Davies, Rudi Studer, Paul Warren (2006), Semantic Web Technologies, Trends and Research in Ontology Based Systems, John Wiley & Sons, England.
2. Liyang Yu (2007), Introduction to the Semantic Web and Semantic Web Services, Chapman & Hall / CRC , USA.
3. Heiner Stuckenschmidt, Frank Van Ilarmelen (2005), Information sharing on the semantic Web, Springer Publications, New York.

GAME DEVELOPMENT USING CUDA
(PROFESSIONAL ELECTIVE- III)

Course Code: A2628

L	T	P	C
3	1	0	4

UNIT – I **(12 Lectures)**

INTRODUCTION AND HISTORY: GPUs as Parallel Computers, Architecture of a Modern GPU, Why More Speed or Parallelism, Parallel Programming Languages and Models, Overarching Goals, Evolution of Graphics Pipelines, The Era of Fixed-Function, Graphics Pipelines, Evolution of Programmable Real-Time Graphics, Unified Graphics and Computing Processors, GPGPU-An Intermediate Step, GPU Computing, Scalable GPUs, Recent Developments, Future Trends.

UNIT – II **(15 Lectures)**

INTRODUCTION TO CUDA: Data Parallelism, CUDA Program Structure, A Matrix-Matrix Multiplication Example, Device Memories and Data Transfer, Kernel Functions and Threading, Function declarations, Kernel launch, Predefined variables, Runtime API.CUDA Thread Organization, Using block Id X and thread Id x , Synchronization and Transparent Scalability, Thread Assignment, Thread Scheduling and Latency Tolerance.

UNIT – III **(12 Lectures)**

CUDA MEMORIES: Importance of Memory Access Efficiency, CUDA Device Memory Types, a Strategy for Reducing Global Memory Traffic, Memory as a Limiting Factor to Parallelism, Global Memory Bandwidth. DYNAMIC PARTITIONING OF SM RESOURCES: Data Perfecting, Instruction Mix, Thread Granularity, Measured Performance.

UNIT – IV **(14 Lectures)**

INTRODUCTION TO OPENCL: Introduction to OPENCL, Background, Data Parallelism Model, Device Architecture, Kernel Functions, Device Management and Kernel Launch, Electrostatic Potential Map in OpenCL.

UNIT – V **(12 Lectures)**

GAME DESIGN AND DEVELOPMENT: Concept of Game Design and Development and case studies.

Text Books:

1. David B Kirk, Wen Mei W Hwu (2010), Programming Massively Parallel Processors: A Hands - on Approach, Elsevier India Private Limited, India.

Reference Books:

1. Jason Sanders, Edward Kandrot (2010), Cuda by Example: An Introduction to General-Purpose GPU Programming, Addison-Wesley Professional, USA.
2. Steve Rabin (2010), Introduction to Game Development, Volume 2, 2nd edition, Course Technology, Cengage Learning, USA

NETWORK MANAGEMENT SYSTEM
(PROFESSIONAL ELECTIVE- III)

Course Code: **A2629**

L	T	P	C
3	1	-	4

UNIT- I **(12 Lectures)**

DATA COMMUNICATIONS AND NETWORK MANAGEMENT OVERVIEW: Analogy of Telephone Network Management, Communications Protocols and Standards, Case Histories on Networking and Management, Network Management Functions, Network and System Management

UNIT-II **(12 Lectures)**

BASIC FOUNDATIONS: Standards, Models, and Language, Network Management Standards, Network Management Models, Organization Model, Information Model, Communication Model, Functional Model, Network Management Applications, Abstract Syntax Notation One: ASN.1, Encoding Structure.

UNIT –III **(12 Lectures)**

SNMPv1 Network Management: History of SNMP Management, Internet Organizations and Standards, SNMP Model, Organization and Information Models, Communication and Functional Models.

UNI- IV **(12 Lectures)**

SNMP Management: SNMPv2, Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, SNMPv2 Management Information Base, SNMPv2 Protocol.

UNIT-V **(12 Lectures)**

SNMP Management: SNMPv3, SNMPv3 Key Features, SNMPv3 Documentation Architecture, SNMPv3 Applications, SNMPv3 Management Information Base, SNMPv3 User-based Security Model, Access Control.

Text Books:

1. Network Management – Principles and Practice, Mani Subramanian, Addison- Wesley Pub Co, First Edition, 2000.
2. SNMP, SNMPv2, SNMPv3, AND RMON 1 and 2, William Stallings, Addison- Wesley, Third Edition, 1999.

Reference Books:

1. Practical Guide to SNMPv3 and Network Management, David Zeltserman, PHI.
2. Network Security and Management, Second Edition, Brijendra Singh, PHI.
3. Network management, Morris, Pearson Education.
4. Principles of Network System Administration, Mark Burges, Wiley Dreamtech.
5. Distributed Network Management, Paul, John Wiley.

AD-HOC AND SENSOR NETWORKS
(PROFESSIONAL ELECTIVE- III)

Course Code: A2630

L	T	P	C
3	1	-	4

UNIT - I **(13 Lectures)**

INTRODUCTION TO AD HOC NETWORKS: Characteristics of MANETs, Applications of MANETs and challenges of MANETs.

ROUTING IN ADHOC NETWORKS: Criteria for classification, Taxonomy of MANET routing algorithms, Topology based routing algorithms, Position based routing algorithms, otherion based positrouting algorithms.

UNIT - II **(9 Lectures)**

DATA TRANSMISSION: Broadcast storm problem, Broadcasting, Multicasting and Geocasting.

TCP OVER AD HOC: TCP protocol overview, TCP and MANETs, Solutions for TCP over Ad hoc.

UNIT - III **(15 Lectures)**

DATA RETRIEVAL IN SENSOR NETWORKS: Applications, Classification of sensor networks, Architecture of sensor network, Physical layer, MAC layer, Link layer, Routing layer, Transport layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs, Sensor Networks and mobile robots.

UNIT - IV **(11 Lectures)**

SECURITY IN WSN: Security in Ad Hoc networks, Key management, Secure routing, Cooperation in MANETs, Intrusion Detection systems.

UNIT - V **(12 Lectures)**

SENSOR NETWORK PLATFORMS AND TOOLS: Sensor Network Hardware, Berkeley motes, Sensor Network Programming Challenges, Node-Level Software Platforms.

OPERATING SYSTEM: Tiny OS, Imperative Language**:** nesC, Dataflow style language: TinyGALS, Node-Level Simulators, ns-2 and its sensor network extension, TOSSIM.

Text Books:

1. Carlos De Morais Cordeir, Dharma Prakash Aggarwal (2006), Ad Hoc and Sensor Networks - Theory and Applications, World Scientific Publishing Co. Pte. Ltd, Singapore.

Reference Books:

1. Feng Zhao, Leonidas Guibas(2004), Wireless Sensor Networks: An Information Processing Approach, Morgan Kauffman, USA.

MALPRACTICES RULES
DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	Punishment
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, 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)	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.	Has 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/year. The Hall Ticket of the candidate is to be cancelled and sent to the University.
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/year. The candidate is also debarred for two consecutive semesters from class work and all University 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 registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination 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/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	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 that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / 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	In case of students of the college, they 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/year.

	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.	The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of 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/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess 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/year. The candidate is also debarred and forfeits the seat.
9.	If 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 of the colleges 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/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	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/year.
11.	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/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment.	

Frequently asked Questions and Answers about autonomy

1. Who grants Autonomy? UGC, Govt., AICTE or University

In case of Colleges affiliated to a university and where statutes for grant of autonomy are ready, it is the UGC that finally grants autonomy.

2. Shall VCE award its own Degrees?

No. Degree will be awarded by Jawaharlal Nehru Technological University, Hyderabad with a mention of the name Vardhaman College of Engineering on the Degree Certificate.

3. What is the difference between a Deemed University and an Autonomy College?

A Deemed University is fully autonomous to the extent of awarding its own Degree. A Deemed University is usually a Non-Affiliating version of a University and has similar responsibilities like any University. An Autonomous College enjoys Academic Autonomy alone. The University to which an autonomous college is affiliated will have checks on the performance of the autonomous college.

4. How will the Foreign Universities or other stake – holders know that we are an Autonomous College?

Autonomous status, once declared, shall be accepted by all the stake holders. Foreign Universities and Indian Industries will know our status through our college website.

5. What is the change of Status for Students and Teachers if we become Autonomous?

An autonomous college carries a prestigious image. Autonomy is actually earned out of continued past efforts on academic performances, capability of self-governance and the kind of quality education we offer.

6. Who will check whether the academic standard is maintained / improved after Autonomy? How will it be checked?

There is a built in mechanism in the autonomous working for this purpose. An Internal Committee called Academic Programme Evaluation Committee is a Non – Statutory body, which will keep a watch on the academics and keep its reports and recommendations every year. In addition to Academic Council, the highest academic body also supervises the academic matters. At the end of three years, there is an external inspection by the University for this purpose. The standards of our question papers, the regularity of academic calendar, attendance of students, speed and transparency of result declaration and such other parameters are involved in this process.

7. Will the students of VCE as an Autonomous College qualify for University Medals and Prizes for academic excellence?

No. VCE has instituted its own awards, medals, etc. for the academic performance of the students. However for all other events like sports, cultural and co-curricular organized by the University the students shall qualify.

8. Can VCE have its own Convocation?

No, since the University awards the Degree the Convocation will be that of the University.

9. Can VCE give a provisional degree certificate?

Since the examinations are conducted by VCE and the results are also declared by VCE, the college sends a list of successful candidates with their final percentage of marks to the University. Therefore with the prior permission of the University the college will be entitled to give the provisional certificate.

10. Will Academic Autonomy make a positive impact on the Placements or Employability?

Certainly. The number of students qualifying for placement interviews is expected to improve, due to rigorous and repetitive classroom teaching and continuous assessment, besides the autonomous status is more responsive to the needs of the industry. As a result, there will be a lot of scope for industry oriented skill development built-in into the system. The graduates from an autonomous college will therefore represent better employability.

11. What is the proportion of Internal and External Assessment as an Autonomous College?

Presently, it is 25 % for internal assessment and 75 % for external assessment. As the autonomy matures the internal assessment component shall be increased at the cost of external assessment.

12. Will there be any Revaluation or Re-Examination System?

No. There will not be any Revaluation system or Re-examination. But, there is a personal verification of the answer scripts.

13. How fast Syllabi can be and should be changed?

Autonomy allows us the freedom to change the syllabi as often as we need.

14. Will the Degree be awarded on the basis of only final year performance?

No. The percentage of marks will reflect the average performance of all the semesters put together.

15. Who takes Decisions on Academic matters?

The Academic Council of College is the top academic body and is responsible for all the academic decisions. Many decisions are also taken at the lower level like the BOS which are like Boards of Studies of the University.

16. What is the role of Examination committee?

The Exam Committee is responsible for the smooth conduct of inter and external examinations. All matters involving the conduct of examinations, spot valuations, tabulations, preparation of Memorandum of Marks etc fall within the duties of the Examination Committee.

17. Is there any mechanism for Grievance Redressal?

Yes, the college has grievance redressal committee, headed by a senior faculty member of the college.

18. How many attempts are permitted for obtaining a Degree?

All such matters are defined in Rules & Regulations.

19. Who declares the result?

The result declaration process is also defined. After tabulation work the entire result is reviewed by the Moderation Committee. Any unusual deviations or gross level discrepancies are deliberated and removed. The entire result is discussed in the College Academic Council for its approval. The result is then declared on the college notice boards as well put on the web site of the college. It is eventually sent to the University.

20. What is our relationship with the Jawaharlal Nehru Technological University, Hyderabad?

We remain an affiliated college of the Jawaharlal Nehru Technological University, Hyderabad. The University has the right to nominate its members on the academic bodies of the college.

21. Shall we require University approval if we want to start any New Courses?

Yes, It is expected that approvals or such other matters from an autonomous college will receive priority.

22. Shall we get autonomy for PG and Doctoral Programmes also?

Yes, presently our UG and PG programmes are also enjoying autonomous status.

23. How many exams will be there as an autonomous college?

This is defined in the Rules & Regulations.

VARDHAMAN COLLEGE OF ENGINEERING, HYDERABAD

Undertaking by Students/Parents

"To make the students **attend** the classes regularly from the first day of starting of classes and be aware of the **College regulations**, the following Undertaking Form is introduced which should be signed by both **student and parent**. The same should be submitted to the College Administrative Office."

I, Mr. / Ms. ---------- bearing Roll No: ---------- joining in I Semester for the academic year 2014-15 in Vardhaman College of Engineering, Hyderabad, do hereby undertake and abide by the following terms, and I will bring the **ACKNOWLEDGEMENT** duly signed by me and my parent and submit it to the Admin Office.

1. I will **attend** all the classes from the **joining day** of the College as per the timetable. In case, I do not turn up even after two weeks of starting of classes, I shall be **ineligible** to continue for the current academic year.
2. I will be regular and punctual to all the classes (theory/practical/drawing) and secure overall attendance of **not less than 75%** as stipulated by College/JNT University Hyderabad. I am fully aware that an overall attendance of less **than 65% will make me lose one year.**
3. I will compulsorily follow the **dress code** prescribed by the college.
4. I will conduct myself in a highly **disciplined** and decent manner both inside the classroom and in the campus, failing which suitable action may be taken against me as per the rules and regulations of the College.
5. I will concentrate on my **studies** without wasting time in the Campus/Hostel/Residence and attend all the **tests** to secure more than the minimum prescribed Class/Sessional Marks in each subject. I will submit the **assignments** given in time to improve my performance.
6. I will not bring **Mobile Phone** to the College campus and also, I will not involve in any form of **ragging** inside or outside the campus. I am fully aware that bringing mobile phone to the campus and involving in Ragging is an **offence** and punishable as per JNTU/UGC rules and law.
7. I will **pay** tuition fees, examination fees and any other **dues** within the stipulated time as required by the Institute authorities failing which I will not be permitted to attend the classes.
8. I will **not cause or involve** in any sort of **violence or disturbance** both within and outside the college campus.
9. If I **absent continuously for 3 days**, my **parents** will have to meet the concerned HOD/ Principal.
10. I hereby **acknowledge** that I have **received** the **R14 Academic Rules and Regulations, Syllabus copy** and I shall **abide** by all the rules specified in it.

ACKNOWLEDGEMENT

I have gone through carefully the terms of the above undertaking and understand that following these are for my/his/her own benefit and improvement. I also understand that if I/he/she fail to comply with these terms, will be liable to suitable action as per College/JNT University Hyderabad rules and law. I undertake that I/he/she will strictly follow the above terms.

Signature of Student

Signature of Parent
Name & Address with Phone Number