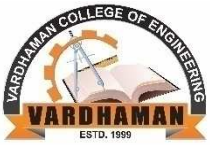

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

Affiliated to JNTUH, Approved by AICTE, Accredited by NAAC and ISO 9001:2008 Certified

Shamshabad - 501 218, Hyderabad, Telangana State, India.

www.vardhaman.org

BACHELOR OF TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

(Accredited by NBA)

ACADEMIC REGULATIONS
COURSE STRUCTURE (VCE-R14)

CHOICE BASED CREDIT SYSTEM

B. Tech. - Regular Four Year Degree Program
(For batches admitted from the Academic Year 2014 - 2015)
&
B. Tech. - Lateral Entry Scheme
(For batches admitted from the Academic Year 2015 - 2016)

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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" means 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: Linear Algebra and Ordinary Differential Equations, A2501: Programming for Problem Solving, etc. The description of allocation of course code is mentioned in the table 1.

Table 1: Course Code Description

First Digit	Second Digit	Third Digit	Fourth and Fifth Digits
Indicates Program	**Indicates Regulation**	**Indicates Department**	**Indicates Course Number**
A : B. Tech. **B** : M. Tech. **C** : MBA	**1** : R11 **2** : R14	**0**: H&S/MBA **1** : Civil **2** : EEE **3** : MECH **4** : ECE	**01** **02** **..** **..**

		5: CSE **6** : IT	

- T – Tutorial, P – Practical, D – Drawing, L - Theory, C - Credits

FOREWORD

The autonomy 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 norms set by 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 Board of Studies are constituted under the guidance of the Governing Body of the College and recommendations of the JNTUH to frame the regulations, course structure and syllabi under autonomous status.

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

VARDHAMAN COLLEGE OF ENGINEERING

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Vision:

To be a pioneer institute and leader in engineering education to address societal needs through education and practice.

Mission:

- To adopt innovative student centric learning methods.
- To enhance professional and entrepreneurial skills through industry institute interaction.
- To train the students to meet dynamic needs of the society.
- To promote research and continuing education.

Quality Policy:

We at Vardhaman College of Engineering, endeavour to uphold excellence in all spheres by adopting best practices in effort and effect.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Department Vision:

To be a leading source of competent computer engineers, meeting the needs of industry and society at large.

Department Mission:

- Facilitate learning in advanced technologies adopting innovative methods
- Associate continuously with industry, with focus on curriculum design and implementation.
- Promote Research and Development through Special Interest Groups (SIGs)
- Provide platform for harnessing entrepreneurial and leadership qualities.

Program Educational Objectives (PEOs)

PEO1: Graduate will establish himself/herself as effective professionals by solving real world problems using investigative and analytical skills along with the knowledge acquired in the field of Computer Science and Engineering.

PEO2: Graduate will demonstrate his/her ability to adapt to rapidly changing environment in advanced areas of Computer Science and scale new height in their profession through lifelong learning.

PEO3: Graduate will prove his/her ability to work and communicate effectively as a team member and /or leader to complete the task with minimal resources, meeting deadlines.

PEO4: Graduate will embrace professional code of ethics in the profession while deliberately being part of projects which contributes to the society at large without disturbing the ecological balance.

Program Outcomes (POs):

PO1: **Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems**.**

PO2: **Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences**.**

PO3: **Design/ Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for the public health and safety, and cultural, societal, and environmental considerations**.**

PO4: **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions**.**

PO5: **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: **The Engineer and Society:**Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice**.**

PO7: **Environment and Sustainability:**Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development**.**

PO8: **Ethics:**Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice**.**

PO9: **Individual and Team Work:**Function effectively as an individual, and as a member or leader in diverse teams, and in multi-disciplinary settings**.**

PO10: **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**.**

PO11: **Project Management and Finance:**Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments**.**

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

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ACADEMIC REGULATIONS

B. Tech. - Regular Four Year Degree Program
(For batches admitted from the Academic Year 2014 - 2015)
&
B. Tech. - Lateral Entry Scheme
(For batches admitted from the Academic Year 2015 - 2016)

For pursuing undergraduate Bachelor Degree Program of study in Engineering (B. Tech.) offered by Vardhaman College of Engineering under Choice Based Credit System (CBCS)and herein after Vardhaman College of Engineering is 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 hereinafter shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman of Academic Council is final. As per the requirements of statutory bodies, Principal, Vardhaman College of Engineering shall be the Chairman of the Academic Council.

3. ADMISSION

3.1. Admission into First year of Four Year B. Tech. Degree Program of study in Engineering:

3.1.1. Eligibility:

A candidate seeking admission into the first year of four-year B. Tech. Degree Program 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 theguidelines of APSCHE.

(ii) Secured a rank in the EAMCET examination conducted by A.P. State Council forHigher 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 Program in Engineering

3.2.1. Eligibility:

A student seeking admission under lateral entry into the II year I semester B. Tech. Degree Program should have passed the qualifying exam (B.Sc. Mathematics & Diploma holders), based on the rank secured by the student at Engineering Common Entrance Test (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 II year of four-year B. Tech degree Program through Convener, ECET (FDH) 20% against the sanctioned strength in each Program of study under lateral entry scheme.

4. PROGRAMS OFFERED

Vardhaman College of Engineering, an autonomous college affiliated to JNTUH, offers the following B. Tech Programs of study leading to the award of B. Tech. Degree under the autonomous status.

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

5. MEDIUM OF INSTRUCTION

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

6. DURATION OF THE PROGRAMS

6.1. Minimum Duration

6.1.1. B. Tech. Degree program duration is for a period of minimum four academic years leading to the Degree of Bachelor of Technology (B.Tech.) of the Jawaharlal Nehru Technological University Hyderabad.

6.1.2. For students admitted under lateral entry scheme, B. Tech. Degree program duration is for a period of minimum three academic years leading to the Degree of Bachelor of Technology (B.Tech.) of the Jawaharlal Nehru Technological University Hyderabad (JNTUH).

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.

6.1.1. 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.

6.1.2. The period is calculated from the academic year in which the student is admitted for the first time into the B. Tech. Degree Program.

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 2: 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. PROGRAM STRUCTURE

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

The Program 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. Program will be placed in one of the ten groups of courses with credits as listed in the Table 3.

Note: All components prescribed in the curriculum of any program of study shall be conducted andevaluated.

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

Table 3: Group of courses

S. NO	GROUP OF COURSES	CATEGORY	RANGE OF TOTAL 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 Saturday will be observed as holiday 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.
- credits for three (or more) period hours of practicals.
- credits for mini project.
- credits for technical seminar with 6 periods per week.
- 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. program of study shall have 220 credits in total. 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. program 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 workto 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 each course is a continuous process and is based on their performance in different examinations and attendance as mentioned below:

Table 4: Method of Evaluation

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 18^{th} 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 PRACTICAL

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-today 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-I, Engineering Drawing-II 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 awarding 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 orhis/her nominee, two senior faculty of the respective department and an external examiner fromoutside the college. This is aimed at assessing the student's understanding of various subjectsstudied during the entire program of 4 years. The comprehensive viva shall be evaluated for 50marks at the end of VIII semester. A minimum of 40% of maximum marks shall be obtained to earnthe 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 END SEMESTER EXAMINATION

11.1. A student shall be eligible to appear for end semester 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 that is 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 end semester 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 or absent in regular examinations. Such students writing supplementary examinations may have to write more than one examination per day.

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

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion / completion of regular B. Tech. Program 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 and project, if he secures not less than 35% of marks in the end semester examination and a minimum of 40% of marks in the sum of the internal evaluation and end semester 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. TRANSITORYREGULATIONS

Students who are detained for lack 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 the 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. program (Batches admitted from 2014-2015)

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

- 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 followingconditions:

- 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 Program and is eligible for the award of B. Tech. Degree, he shall be placed in one of the following four classes shown in Table 5:

Table 5: Declaration of Class is based on percentage of marks to be secured

Class Awarded	Grades 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 6: 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 thatsemester.

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 doneaccordingly.

iii. When a component is cancelled as a penalty, he is awarded zero marks in thatcomponent.

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

II. If the student fails to satisfy the norms of discipline specified by the Institute from time to time.

24. CURRICULUM

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

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

25. WITHHOLDING OF RESULTS

If the student has not paid any dues to the college/if any case of indiscipline/malpractice is pending against him/her, the results of the student 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 in 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 and 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 student who involves in malpractice/behaves in an in-disciplinary manner during the examination. The committee shall consist of:

Principal
Subject expert
Head of the department to which the student belongs to
The invigilator concerned
Controller of Examinations

The committee constituted shall conduct the meeting on the same day of examination or latest by next working day of the incident and punish the student as per the guidelines prescribed by the JNTUH from time to time.

Any action on the part of student at the examination like trying to get undue advantage in the performance at examinations, 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, evaluating 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 will be recommended for 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 College 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 is 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 distribution 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 entryscheme.

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 attemptonly.

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 thecourse.

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

3 (Three) Merit Ranks if the AICTE sanctioned intake is less than or up to60.

4 (Four) Merit Ranks if the AICTE sanctioned intake is greater than60.

5 (Five) Merit Ranks if the AICTE sanctioned intake is greater than120.

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, whereverapplicable.

32. CODE OF CONDUCT

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

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

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 fellowstudents.

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 thestudent.

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 thecollege.

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 collegehostel.

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 suspensionperiod

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 andsatisfying 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 Program, 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.

MALPRACTICES RULES
DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	Punishment
	If the student:	
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 student 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 student orally or by any other body language methods or communicates through cell phones with any student 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 students 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 student is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student 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 student is to be cancelled and sent to the University.
3.	Impersonates any other student in connection with the examination.	The student who has impersonated shall be expelled from examination hall. The student is also debarred and forfeits the seat. The performance of the original student, 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 student is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the student 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 student 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 student is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the student 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 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.	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 student(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The students 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 student 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 student is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the student 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 student 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 student is also debarred and forfeits the seat.
9.	If student of the college, who is not a student 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 student 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 student 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 student 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 student 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.	

COURSE STRUCTURE (VCE-R14)

B. TECH - COMPUTER SCIENCE AND ENGINEERING

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
A2503	Data Structures through C	BE	3	1	-	4	25	75	100
A2402	Electronic Devices and Circuits	BE	3	1	-	4	25	75	100
A2008	Engineering Physics and Engineering Chemistry Lab	BS	-	-	3	2	25	50	75
A2504	Data Structures through C Lab	BE	-	-	6	2	25	50	75
A2405	Electronic Devices and Circuits Lab	BE	-	-	3	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
A2507	Design and Analysis of Algorithms	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 - COMPUTER SCIENCE AND ENGINEERING

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
A2510	Computer Architecture and Organization	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
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
A2517	Compiler Design	CE	3	1	-	4	25	75	100
A2518	Principles of programming Languages	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
A2607	Network Security and Cryptography	CE	3	1	-	4	25	75	100
A2608	Open Source Technologies	CE	3	1	-	4	25	75	100
A2519	Artificial Intelligence	CE	4	-	-	4	25	75	100
A2520	Object Oriented Analysis and Design	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
A2521	Object Oriented Analysis and Design Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH - COMPUTER SCIENCE AND ENGINEERING

REGULATIONS: VCE-R14

VII SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A2611	Cloud Computing	CE	4	-	-	4	25	75	100
A2612	Cyber Security	CE	3	1	-	4	25	75	100
A2522	Software Project Management	CE	4	-	-	4	25	75	100
A2523	Data Mining and Data Warehousing	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
A2528	Data Mining and Data Warehousing Lab	CE	-	-	3	2	25	50	75
A2529	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
A2538	Technical Seminar	TS	-	-	6	2	50	-	50
A2539	Comprehensive Viva	CV	-	-	-	2	-	75	75
A2540	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	Basic Entrepreneurship
A2018	Business Communication
A2019	Project Planning and Management
A2020	Organizational Behavior
INTERDEPARTMENTAL ELECTIVE – II	
A2616	Image Processing and Pattern Recognition
A2220	Power Electronics
A2426	VLSI design
A2351	Robotics
A2154	Air Pollution and Control Methodologies
A2333	Operations Research
PROFESSIONAL ELECTIVE - I	
A2614	Computer Graphics
A2615	Building Enterprise Applications
A2524	Neural Networks
A2525	Rational Application Developer
A2526	Advanced Computer Architecture
A2527	Distributed Operating Systems
PROFESSIONAL ELECTIVE - II	
A2613	Software Testing and Quality Assurance
A2621	Big Data
A2530	Grid Computing
A2531	Natural Language processing
A2532	Distributed Databases
A2533	Multi-Core Architecture and Programming
PROFESSIONAL ELECTIVE - III	
A2626	Information Retrieval System
A2627	Semantic Web and Social Networks
A2628	Game Development Using CUDA
A2534	Fault Tolerant Computing
A2535	Software Architecture
A2536	Soft Computing

SYLLABI FOR
I SEMESTER

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

TECHNICAL ENGLISH

Course Code: A2005

L	T	P	C
4	0	0	4

Course Overview:

The basic idea behind offering Technical English as a subject at the undergraduate level is to acquaint students with a language held by common consent to be the most popular language. The lessons included as part of syllabus, aim to take the nuances of English to students as it reveals its strengths and complexity when used to perform a variety of functions such as present technical seminars, prepare technical papers, abstracts, write effective business ,formal and job application letters , publish articles, etc. . For prospective engineers, nothing could be more useful or productive than being able to reach out to the world of technology and business through communication skills.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Develop an understanding of the significance of humanity, love and service to mankind and be involved in community service

CO2. Perceive the importance of technological impact on society and plan for the technological advancement

CO3. Apply the rules of grammar effectively (articles, prepositions, concord .tenses etc.) in writing reports, technical articles, essays and in day-to-day conversations.

CO4. Build creativity for career planning and entrepreneurship.

CO5. Develop effective written communication skills in academic writing.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

TECHNICAL ENGLISH

Course Code: A2005

L	T	P	C
4	0	0	4

SYLLABUS

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 AnonymsMorphemes

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: SangamBooks
2. B Yadava Raju and C Muralikrishna (2009). *Inspiring Speeches and Lives,* Guntur: MaruthiPublications
3. Meenakshi Raman & Sangeeta Sharma, (2009), *Technical Communication*, Oxford UniversityPress.

REFERENCE BOOKS:

1. Ashraf Rizvi, M (2005) *Effective Technical Communication*, New Delhi: Tata Mc GrawHill.
2. David Green (2010) *Contemporary English Grammar Structures and Composition,* by, MacMillan Publishers, NewDelhi.2010.

3. Meenakshi Raman, *Business Communication with CD*, 2nd Edition, Oxford UniversityPress.
4. Meenakshi Raman, *Technical Communication*, Oxford University Press.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

MATHEMATICS – I

Course Code: A2001

L	T	P	C
3	1	0	4

Course Overview:

This course develops the theory of differential equations and indicating its applications. This course deals with more advanced Engineering Mathematics topics which provide students with the relevant mathematical tools required in the analysis of problems in engineering and scientific professions. Topics include the differential equations of first order and their applications, higher order linear differential equations and their applications, Functions of single variable and multiple integrals, Laplace transforms, Vector integral theorems(Green's, Stoke's and Gauss's divergence theorems). The mathematical skills derived from this course form a necessary base to analytical and design concepts encountered in the program.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. **Solve** the first and higher order linear differential equations.

CO2. **Make use of** differential equations to solve orthogonal trajectories, rate of growth/decay, and Newton's law of cooling, electrical circuits and simple harmonic motion problems.

CO3. **Examine** extremum of a function of several variables and evaluate the multiple integrals.

CO4. **Apply** Laplace transforms to solve differential equation.

CO5. **Evaluate** line, surface and volume integrals using vector integral theorems.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

MATHEMATICS – I

Course Code: A2001

L	T	P	C
3	1	0	4

SYLLABUS

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 $Q(x) \cdot e^{ax}$, $\sin ax$, $\cos ax$, 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

PROBABILITY THEORY AND NUMERICAL METHODS

Course Code: A2004

L	T	P	C
3	1	0	4

Course Overview:

This course is a study of probability theory and numerical techniques used to model engineering systems. Topics in probability include: basic axioms of probability, Baye's Theorem, random variables, discrete and continuous probability distributions. It involves the development of mathematical models and the application of the computer to solve engineering problems using the following computational techniques: root-finding using bracketing and open methods, Interpolation, numerical differentiation, numerical integration, linear and polynomial curve fitting and the solution of differential equations using single step methods and multi -step methods.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Solve real world problems using the theory of probability.
CO2. Identify the types of random variables involved in a given problem and calculate relevant probabilities.
CO3. Develop appropriate Numerical methods to approximate a function.
CO4. Make use of Numerical differentiation and integration in solving problems of engineering.
CO5. Apply appropriate method to find numerical solution of a differential equation.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

PROBABILITY THEORY AND NUMERICAL METHODS

Course Code: A2004

L	T	P	C
3	1	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

BASIC ELECTRICAL ENGINEERING

Course Code: A2201

L	T	P	C
4	0	0	4

Course Overview:

This is a basic course for all Engineering students of first Year. The objective is to make them familiar with basic principles of Electrical Engineering. The course addresses the underlying concepts & methods behind Electrical Engineering. The course is present a problem oriented introductory knowledge of the Fundamentals of Electrical Engineering and to focus on the study of basic electrical parameters, basic principles, different types of electrical circuit and methods to solve electrical circuit.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Apply network reduction techniques and Knowledge of Alternating quantities to calculate Current, Voltage and Power for complex circuits.

CO2. Analyze electrical Circuits using Nodal Analysis, Mesh analysis and Network theorems.

CO3. Apply the concepts of network topology to obtain Node incidence, Tie set and Cut set matrices.

CO4. Design two port networks, their equivalent circuits and obtain their parameters.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

BASIC ELECTRICAL ENGINEERING

Course Code: A2201

L	T	P	C
4	0	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

COMPUTER PROGRAMMING

Course Code: A2501

L	T	P	C
3	1	0	4

Course Overview:

The course is a Basic Engineering course for all computing aspiring students. It is designed to provide a comprehensive study of the C programming language that covers the fundamental principles of computer programming, with an emphasis on problem solving strategies using structured programming techniques. The syntax and constructs of data types, control statements, arrays, functions and pointers are elaborated. The derived data types like structures, union and enumerations is also importantly discussed. The console and file I/O systems are explained with the wide variety of examples and applications. It stresses the strengths of C, which provide students with the means of writing efficient, maintainable and reusable code to solve mathematical, engineering and simple data processing problems.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Write algorithm and draw corresponding flowchart for simple problems besides explaining functions of computer components.

CO2. Select the right identifiers, data types and operators for effective computation.

CO3. Write programs, demonstrating use of control statements, arrays and strings.

CO4. Demonstrate use of functions and pointers by writing programs.

CO5. Write programs for simple real life problems using structures and unions.

CO6. Illustrate use of files by writing programs.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

COMPUTER PROGRAMMING

Course Code: A2501

L	T	P	C
3	1	0	4

SYLLABUS

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 functions, 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: Definition and operations on strings, string variables declaration, reading and writing strings. 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, array 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

Course Code: A2009

L	T	P	C
0	0	3	2

Course Overview:

The basic idea behind offering English as a practical subject at the undergraduate level is to acquaint the students with a language that enjoys currently as a lingua franca of the globe. In the ELCS lab the students are trained in Communicative English Skills: phonetics, word accent, word stress, rhythm and intonation, making effective oral presentations- both extempore and Prepared- seminars, group discussions, presenting techniques of writing, role play, telephonic skills, asking and giving directions, information transfer, debates, description of person, place, objects etc. The lab encourages students to work in a group, engage in peer-reviews and inculcate team spirit through various exercises on grammar, vocabulary, listening and pronunciation games, etc.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Improve their pronunciation using the rules of Phonetics.

CO2. Take part in role-plays and interviews to perform effectively in real life situations.

CO3. Choose appropriate words and phrases to make the telephonic conversation conveying the meaning with etiquettes.

CO4. Minimize the stage fear and make presentations with proper body language.

CO5. Adapt the art of debating and group discussion to present their view point convincingly.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

Course Code: A2009

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

COMPUTER PROGRAMMING LAB

Course Code: A2502

L	T	P	C
0	0	6	2

Course Overview:

This hands-on course provides a comprehensive introduction to the ANSI C language, emphasizing portability and structured design. Students are introduced to all major language elements including data types, control statements and preprocessor directives. Thorough treatment is given to the topics of arrays, functions and pointers. The course elucidates the use of structures, unions, and enumerations. Emphasis is given to the processing of command line arguments and file systems, so as to write flexible, user-friendly programs. Comprehensive hands on exercises are integrated throughout to reinforce learning and develop real competency. It is used to program desktop applications, compilers, tools and utilities and even hardware devices.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Implement programs by selecting the right identifiers, data types and operators for effective computation

CO2. Implement programs, demonstrating use of control statements, arrays and strings.

CO3. Implement programs, demonstrating use of functions and pointers.

CO4. Implement C programs for simple real life problems using structures and unions

CO5. Implement programs illustrating use of files.

CO6. Debug erroneous programs related to the course

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

COMPUTER PROGRAMMING LAB

Course Code: A2502

L	T	P	C
0	0	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.
5. Computer Programming Laboratory Manual (Vardhaman Press).

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

IT WORKSHOP

Course Code: A2601

L	T	P	C
0	0	3	2

Course Overview:

IT workshop works in a learning-by-doing mode. It concentrates more on hands-on experience for the participants rather theoretical classes. It enables the participant to make the best use of Microsoft Office Suite in their day-to-day requirements and make use of it to improve the standards in the educational environment. The IT Workshop prepares the participant to have a hands-on experience in maintaining and troubleshooting a PC by themselves.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Apply knowledge for computer assembling and software installation.
CO2. Ability how to solve the trouble shooting problems.
CO3. Apply the tools for preparation of PPT, Documentation and budget sheet etc.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE I Semester **VCE-R14**

IT WORKSHOP

Course Code: A2601

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

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 an,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.
3. Quamme. – CISCO Press, Pearson Education.
4. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft).
5. IT Workshop Manual (Vardhaman Press).

SYLLABI FOR
II SEMESTER

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

MATHEMATICS - II

Course Code: A2006

L	T	P	C
3	1	0	4

Course Overview:

This course focus on basic areas of theory and more advanced Engineering Mathematics topics which provide students with the relevant mathematical tools required in the analysis of problems in engineering and scientific professions. Topics to be covered in this course include: solution for linear systems, Eigen values & Eigen vectors, linear transformations, partial differential equations, Fourier series, Fourier transforms & Z - transforms. The mathematical skills derived from this course form a necessary base to analytical and design concepts encountered in the program.

- **Prerequisite(s):** Mathematics – I

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Solve system of linear equations using rank of a matrix.

CO2. Examine the nature of the Quadratic form by eigen values and eigen vectors.

CO3. Classify and solve Partial differential equations.

CO4. Develop Fourier series and Fourier transforms of a function

CO5. Apply Z- Transforms to solve difference equations.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

MATHEMATICS - II

Course Code: A2006

L	T	P	C
3	1	0	4

SYLLABUS

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.

RANSFORMS: 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

ENGINEERING PHYSICS

Course Code: A2002

L	T	P	C
4	0	0	4

Course Overview:

Engineering physics is the study of the combined disciplines of physics, engineering and mathematics in order to develop an understanding of the interrelationships of these three disciplines. Fundamental physics is combined with problem solving and engineering skills, which then has broad applications. Career paths for Engineering physics are usually "engineering, applied science or applied physics through research, teaching or entrepreneurial engineering". This interdisciplinary knowledge is designed for the continuous innovation occurring with technology.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Analyze crystal structures in terms of lattice parameters and interpret the structures using X-ray diffraction methods

CO2. Apply the principles of quantum mechanics to analyze the properties of the semiconducting materials.

CO3. Categorize nano and dielectric materials. Discuss synthesis and react to environmental concerns due to nanotechnology

CO4. Categorize magnetic materials and objectivize their role in science and technology. Apply magnetism to explain superconductivity.

CO5. Illustrate working of a laser and examine the communication systems using optical fibers

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

ENGINEERING PHYSICS

Course Code: A2002

L	T	P	C
4	0	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

ENGINEERING CHEMISTRY

Course Code: A2003

L	T	P	C
4	0	0	4

Course Overview:

This course will involve minimum lecturing, content will be delivered through assigned reading and reinforced with large and small group discussions, as well as assigned in class (and occasional out of class) group activities. Water and its treatment for various purposes, engineering materials such as plastics, composites, ceramic, abrasives, their preparation, properties and applications, conventional and non-conventional energy sources, nuclear, solar, various batteries, combustion calculations, corrosion and control of metallic materials.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Apply the knowledge of standard electrode potentials of various metals and nonmetals to protect them from corrosion.

CO2. Identify difference and similarities of three types of Batteries.

CO3. Compare different methods of softening of hard water.

CO4. Apply the knowledge of Materials, Fuels and Nano particles in controlling pollution.

CO5. Compare and contrast the chemical behavior, properties and applications of engineering substances.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

ENGINEERING CHEMISTRY

Course Code: A2003

L	T	P	C
4	0	0	4

SYLLABUS

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. PC 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

DATA STRUCTURES THROUGH C

Course Code: A2503

L	T	P	C
3	1	0	4

Course Overview:

Data Structures is a subject of primary importance to the discipline of Computer Science and Engineering. It is a logical and mathematical model of sorting and organizing data in a particular way in a computer, required for designing and implementing efficient algorithms and program development. Different kinds of data structures like arrays, linked lists, stacks, queues, etc, are suited to different kinds of applications. Some specific data structures are essential ingredients of many efficient algorithms, and make possible the management of huge amounts of data, such as large databases and internet indexing services. Nowadays, various programming languages like C, C++ and Java are used to implement the concepts of Data Structures, of which C remains the language of choice for programmers across the world.

Prerequisite(s):

- Computer Programming

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Solve computer software problems by using recursive, non recursive techniques and, analyze various algorithms with respect to time and space complexity.

CO2. Demonstrate ability to exhibit knowledge of various searching and sorting techniques and identify potential benefits of each one over the other and propose appropriate technique to solve programming problems.

CO3. Illustrate the application of linear stack and queue.

CO4. Exhibit the skills of demonstrating use of linked list.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

DATA STRUCTURES THROUGH C

Course Code: A2503

L	T	P	C
3	1	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

ELECTRONIC DEVICES AND CIRCUITS

Course Code: A2402

L	T	P	C
3	1	0	4

Course Overview:

This course covers fundamental topics that are common to a wide variety of electronic devices, circuits and systems. The topics include right from the inception of evolution of semiconductor devices to their real time applications. This course starts with basics of semiconductors, review the operation and characteristics of semiconductor devices (namely, semiconductor diodes, BJTs, JFETs and MOSFETs), and build-up to more advanced topics in analog circuit designs. This course provides a basis for students to continue education by undertaking advanced study and research in the variety of different branches of semiconductor device applications.

Prerequisite(s):

- Engineering Physics
- Basic Electrical Engineering

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Analyze the physical behavior of diodes and transistors.

CO2. Compare various rectifiers, filters, transistors, biasing circuits and transistor amplifier configurations.

CO3. Apply various stabilization and compensation techniques to obtain stable operating point of transistor.

CO4. Analyze single stage amplifier circuits using small signal low frequency transistor model.

CO5. Design regulated power supply and amplifier circuits for given specifications.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

ELECTRONIC DEVICES AND CIRCUITS

Course Code: A2402

L	T	P	C
3	1	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LAB

Course Code: A2008

L	T	P	C
0	0	3	2

Course Overview:

Engineering physics laboratory course includes the experimental methods for the determination of mechanical property (Rigidity modulus of a given material), frequency of an AC signal, basic electronic circuits (LED, RC circuit), and to study characteristics of LASERS & Optical fiber (LASER wavelength, divergence, Numerical aperture of fiber, Losses in fibers). This interdisciplinary knowledge is designed for the continuous innovation occurring with technology.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Analyze the rigidity modulus of the given material to interpret the mechanical properties.

CO2. Estimate the frequency of AC power supply and time constant of a R-C circuit.

CO3. Apply the principles of optics to evaluate the characteristics of LED, laser and optical fibres.

CO4. Apply various titrations for the estimation of strengths of solutions and hardness of water.

CO5. Analyze the effect of temperature on viscosity and surface tension of liquids.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LAB

Course Code: A2008

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

DATA STRUCTURES THROUGH C LAB

Course Code: A2504

L	T	P	C
0	0	6	2

Course Overview:

This Laboratory is meant to make the students to learn efficient data structures and algorithms that use them, designing and writing large programs. This laboratory emphasizes on how to choose appropriate data structures for solving real world problems with best efficiency and performance.

Prerequisite(s): Computer Programming Through C Lab: A3502

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Solve computer hardware and software problems by using recursive, non-recursive or both techniques and to Apply asymptotic notations to evaluate the performance of an algorithm.

CO2. Familiarize and define the programming syntax and constructs of data structures to develop elegant, legible and reusable codes

CO3. Analyze and implement various searching techniques suitable to resolve data searching problems.

CO4. Demonstrate ability to exhibit knowledge of various sorting techniques and identify the potential benefits of each one over the other.

CO5. Illustrate about linear data structures like stacks and queues representations and operations and apply them to design and build C based real-time applications.

CO6. Create novel solutions for non-linear data structures by applying Trees and Graphs traversals.

CO7. Comprehend the habit of intelligent reading to participate and succeed in competitive exams and prosper in professional career path.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

DATA STRUCTURES THROUGH C LAB

Course Code: A2504

L	T	P	C
0	0	6	2

LIST OF EXPERIMENTS

Week- 1: (Recursion function)

a) Write recursive program which computes the nth Fibonacci number, for appropriate values of n.
b) Write recursive program to find xy, 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.
3. Data Structures through C Laboratory Manual (Vardhaman Press).

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE II Semester **VCE-R14**

ELECTRONIC DEVICES AND CIRCUITS LAB

Course Code: A2405

L	T	P	C
0	0	3	2

Course Overview:

The electronic devices and circuits lab is one of the first electronics and communication engineering lab course that a student will undergo. The students become familiar with laboratory test and measuring instruments such as CRO, dual regulated power supply, function generator and multimeter. The exposure of the students to these instruments and the knowledge about basic electronic components will enable them to design, construct and test the basic electronic circuits such as power supplies and amplifiers.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Identify and use various electronic components, test and measuring instruments that are frequently used in experimentation of various circuits.

CO2. Interpret the V - I characteristics of various electronic devices so as to realize the applications like switching, regulation and amplification.

CO3. Design a simple regulated power supply by making use of rectifiers, filters and regulators.

CO4. Apply various biasing techniques to fix the operating point and stabilize the given transistor.

CO5. Analyze the transient and frequency response of single stage amplifier circuits.

VARDHAMAN COLLEGE OF ENGINEERING

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B. Tech. CSE II Semester **VCE-R14**

ELECTRONIC DEVICES AND CIRCUITS LAB

Course Code: A2405

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

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.

SYLLABI FOR
III SEMESTER

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Code: A2012

L	T	P	C
4	0	0	4

Course Overview:

This course addresses the concepts, principles and techniques of Managerial Economics and Financial Analysis. It covers the fundamentals of Managerial Economics and its various techniques such as demand, elasticity of demand, demand forecasting, production laws, cost concepts, price determination in various type of markets and pricing strategies. Apart from Capital budgeting and its techniques, Financial Analysis gives clear idea about concepts and conventions of accounting, accounting procedures like journal, ledger, trial balance, balance sheet and interpretation of financial statements through ratios.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Explain and infer the concepts of Managerial Economics and Financial Accounting

CO2. Analyze the demand, production, cost and break even to know interrelationship of among variables and their impact

CO3. Classify the market structure to decide the fixation of suitable price.

CO4. Analyze the types of business and decide which form of business suits for their requirement

CO5. Apply capital budgeting techniques to select best investment opportunity

CO6. Prepare financial statements and analyze them to assess financial health of business.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Code: A2012

L	T	P	C
4	0	0	4

SYLLABUS

UNIT - I

INTRODUCTION TO MANAGERIAL ECONOMICS: Definition, nature and scope managerial economics. Demand analysis - demand determinants, law of demand and its exceptions.

ELASTICITY OF DEMAND - Definition, types, measurement and significance of elasticity of demand. Demand forecasting, factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting**).**

UNIT - II

THEORY OF PRODUCTION AND COST ANALYSIS: Production function - isoquants and isocosts, MRTS, least cost combination of inputs, production function, laws of returns, internal and external economies of scale.

COST ANALYSIS - cost concepts, opportunity cost, fixed vs. variable costs, explicit costs vs. implicit costs, out of pocket costs vs. imputed costs. Break Even Analysis (BEA), termination of break even point (simple problems), managerial significance and limitations of BEA.

UNIT - III

INTRODUCTION TO MARKETS AND PRICING STRATEGIES: Market structures - types of competition, features of perfect competition, monopoly and monopolistic competition. Price-output determination in case of perfect competition and monopoly. Pricing strategies.

UNIT - IV

BUSINESS AND NEW ECONOMIC ENVIRONMENT: Characteristic features of business, features and evaluation of sole proprietorship, partnership, joint stock company, public enterprises and their types, changing business environment in post-liberalization scenario.

CAPITAL AND CAPITAL BUDGETING: capital and its significance, types of capital, estimation of fixed and working capital requirements, methods and sources of raising finance. Nature and scope of capital budgeting, features of capital budgeting proposals, methods of capital budgeting: payback method, Accounting Rate of Return (ARR) and net present value method (simple problems).

UNIT - V

INTRODUCTION TO FINANCIAL ACCOUNTING: Double entry book keeping, journal, ledger, trial balance- final accounts (trading account, profit and loss account and balance sheet with simple adjustments).

FINANCIAL ANALYSIS THROUGH RATIOS - computation, analysis and interpretation of liquidity ratios (current ratio and quick ratio), activity ratios (inventory turnover ratio and debtor turnover ratio), capital structure ratios (debt- equity ratio, interest coverage ratio), and profitability ratios (gross profit ratio, net profit ratio, operating ratio, P/E Ratio and EPS).

TEXT BOOKS:

1. Aryasri (2005), Managerial Economics and Financial Analysis, 2nd edition, Tata McGraw Hill, New Delhi.
2. Varshney, Maheswari (2003), *Managerial Economics*, Sultan Chand, New Delhi.

REFERENCE BOOKS:

1. Ambrish Gupta (2004), Financial Accounting for Management, Pearson Education, New Delhi.
2. Domnick Salvatore (2003), Managerial Economics in a Global Economy, 4th edition, Thomson Publications, India.

3. Narayanaswamy (2005), Financial Accounting - A Managerial Perspective, Prentice Hall of India, India.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

DISCRETE MATHEMATICAL STRUCTURES

Course Code: A2505

L	T	P	C
3	1	0	4

Course Overview:

This course is an elementary discrete mathematics oriented towards applications in Computer Science and Engineering. It emphasizes mathematical definitions and proofs as well as applicable methods. Topics include formal logic notation, proof methods; induction, well-ordering; sets, relations; growth of functions; permutations and combinations, counting principles. Further selected topics may also be covered, such as recursive definition, recurrences; generating functions

Prerequisite(s): Mathematics-II

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Identifies the difference between the notion of discrete and continues mathematical structures.

CO2. Analyze the basic concepts of relations and functions.

CO3. Demonstrate the ability to solve problems using counting techniques and combinatorics to solve complex problems.

CO4. Define and relate basic notions in graph theory.

CO5. Apply different recurrence relation solving methods to solve real time applications.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

DISCRETE MATHEMATICAL STRUCTURES

Course Code: A2505

L	T	P	C
3	1	0	4

SYLLABUS

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: 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 CourseTechnology, India.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

DIGITAL LOGIC DESIGN

Course Code: A2406

L	T	P	C
3	1	0	4

Course Overview:

This course provides a modern introduction to logic design and the basic building blocks used in digital systems, in particular digital computers. It starts with a discussion of information representation and number systems, Boolean algebra, logic gates and minimization techniques. The second part of the course deals with combinational and sequential logic, where in the procedures to analyze and design the same will be discussed. State machines will then be discussed and illustrated through case studies of complex systems. The course has an accompanying lab that integrates hands-on experience with LabVIEW software including logic simulation, implementation and verification of all the combinational and sequential circuits. Moreover, this course forms the basis for the study of advanced subjects like Computer Architecture and Organization, Microprocessors and Interfacing and Embedded systems.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Able to understand the number system, conversions, boolean algebra and also apply the albreaic simplication methods and k – maps to simplify the standard forms.

CO2. Learn and apply the combinational logic to design the combinational circuits.

CO3. Able to understand the micro-operations, instructions, addressing modes and design the circuits.

CO4. Analyze the computer arithmetic algorithms and memory organization.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

DIGITAL LOGIC DESIGN

Course Code: A2406

L	T	P	C
3	1	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

OPERATING SYSTEMS

Course Code: A2506

L	T	P	C
4	0	0	4

Course Overview:

Operating Systems Course is intended as a general introduction to the techniques used to implement operating systems. The topics covered will be functions of operating systems, process management processor scheduling; deadlock prevention, avoidance, and recovery; main-memory management; virtual memory management; control of disks and other input/output devices; file-system structure and implementation; and protection and security. The course also covers the related UNIX commands and system calls.

Prerequisite(s): Computer Organization and Architecture
Object Oriented Programming

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. **Understand the** concepts of basic operating system, Process Management.
CO2. **Apply** Synchronization and Concurrency Control in inter process communication.
CO3. **Use** Deadlock handling methods.
CO4. **Apply** the concepts of Memory Management techniques.
CO5. **Use** File and Disk Management Schemes for effective
CO6. **Examine** different Protection and Security principles associated with Operating Systems.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

OPERATING SYSTEMS

Course Code: A2506

L	T	P	C
4	0	0	4

SYLLABUS

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.

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 ,RAID, stable storage implementation, tertiary storage structure.

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

DESIGN AND ANALYSIS OF ALGORITHMS

Course Code: A2507

L	T	P	C
3	1	0	4

Course Overview:

This course is to introduce the topic of algorithms as a precise mathematical concept, and study how to design algorithms, establish their correctness, also study their efficiency and memory needs. The course offers a strong mathematical component in addition to the design of various algorithms.

Prerequisite(s): Data Structures
Mathematics –II

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. **Demonstrate** the importance various algorithmic notations and their usage to give asymptotic upper, lower bounds on time and space complexity of algorithms.
CO2. **Apply** divide and conquer strategy to solve various computing problems.
CO3. **Estimate** all feasible solutions using greedy strategy and recite an algorithm that employs this strategy.
CO4. **Construct** algorithms for solving real world problems using dynamic programming.
CO5. **Apply** fundamental graph traversal techniques to solve various applications using backtracking.
CO6. **Analyze** Branch and Bound techniques and explain the significance of NP Completeness.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

DESIGN AND ANALYSIS OF ALGORITHMS

Course Code: A2507

L	T	P	C
3	1	0	4

SYLLABUS

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, Substitution method, Iteration method, Master's Method.

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 - II

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

GREEDY METHOD: General method, applications-job sequencing with deadlines, Real Knapsack problem, minimum cost spanning trees, single source shortest path problem, optimal storage on tapes.

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 coloring, Knapsack problem, Hamiltonian cycles.

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

UNIT - V

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

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

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 Astrategic 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Course Code: A2508

L	T	P	C
4	0	0	4

Course Overview:

The Course provides a comprehensive coverage of conceptual and practical Java language, describing its syntax, keywords, and fundamental programming principles to become a proficient Java Programmer. The course is divided into five units, each focusing on a different aspect of core Java Environment suitable to write efficient, maintainable, and portable code. At the outset, the course ignites Object Oriented thinking and explores with the evolution of Java and its basics. It gives strong foundation on Inheritance, Packages and Interfaces and also discusses Exception Handling and Multithreaded mechanisms. The course examines java concepts such as Applets and Event handling. The course end up with nourishing AWT Controls and Swing concepts used for GUI applications. Overall, the knowledge of this course is essential to learn advanced Java and other OOP based languages and hence, stands as a pre-requisite for few fore coming courses like Struts and Spring Framework, Hibernate Framework. The course also plays a vital role in building front-end applications for Mini and Major Project Works in the final year.

Prerequisite(s): Data Structures

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. **Analyze** the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP like encapsulation, Inheritance and Polymorphism.

CO2. **Demonstrate** an ability to design high speed, fault tolerant applications using multi threading and exception handling concepts.

CO3. **Excel** in contemporary Java based integrated development environments to develop rich GUI applications.

CO4. **Develop** confidence for self-education and ability for life-long learning needed for advanced java technologies.

CO5. **Prepare** for competitive examinations like GATE, Engineering services, recruitment interviews etc.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Course Code: A2508

L	T	P	C
4	0	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

JAVA PROGRAMMING LAB

Course Code: A2509

L	T	P	C
0	0	3	2

Course Overview:

The hands-on course provides a comprehensive coverage of practical Java language, describing its syntax, keywords, and fundamental programming principles to become a proficient Java Programmer. The course stress on the strengths of Java to write efficient, maintainable, and portable code. The course focuses on a different aspect of core Java Environment suitable for advance learning, teaching, research, and commercial software development. At the outset it revise the control statements and then explores with the concepts of Inheritance and Interfaces. Exception Handling, Multithreaded mechanisms and File I/O is also been practiced. The concepts such as AWT Controls, Event handling, Applets and Swings are deeply Practiced to build GUI based applications. Overall, the knowledge of this course is essential to learn other similar OOP based technologies and advanced Java and hence stands as a pre-requisite for few fore coming courses like Struts and Spring Framework, Hibernate Framework, and to build Mini and Major Project Work applications

Prerequisite(s): Data structures Lab

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Develop programs with classes and objects, constructors, methods, arrays and strings.
CO2. Able to use polymorphism and inheritance appropriately.
CO3. Develop efficient programs with exception handling and maximized use of CPU with multithreading.
CO4. Demonstrate the ability to design GUI based applications using AWT and Swing components.
CO5. Develop small applet application that is to be placed on a web page.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

JAVA PROGRAMMING LAB

Course Code: A2509

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

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 Custom Exception Test class, the age is expected to be a positive number. It would throw the user defined exception Negative Age Exception 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.

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).

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

COMPUTER AIDED ENGINEERING DRAWING LAB

Course Code: A2306

L	T	P	C
0	0	3	2

Course Overview:

Computer Aided Design (CAD) is the use of computer systems to assist in the creation, modification, analysis, or optimization of a design. CAD provides a convenient means to create designs for almost every engineering discipline. Computer-aided manufacturing (CAM) is the use of computer -based software tools that assist engineers and machinists in manufacturing or prototyping product components. Its primary purpose is to create a faster production process and components with more precise dimensions and material consistency, which in some cases, uses only the required amount of raw material (thus minimizing waste), while simultaneously reducing energy consumption. CAM is a programming tool that makes it possible to manufacture physical models using computer-aided design (CAD) programs. CAM creates real life versions of components designed within a software package.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. **Use** AUTO CAD commands for Computer Aided Drafting and Designing.

CO2. **Represent** the objects using different types of lines and dimensioning rules.

CO3. **Analyze** the objects such as points, lines and planes held in different orientations using CAD tools.

CO4. **Convert** isometric projections to orthographic projections and vice-versa.

CO5. **Analyze** regular solids held in different orientations using CAD tools.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE III Semester **VCE-R14**

COMPUTER AIDED ENGINEERING DRAWING LAB

Course Code: A2306

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

1. DRAFTING: Development of part drawings for various components in the form of orthographic and isometric. Representation of Dimensioning and tolerances scanning and plotting.
2. PART MODELING: Generation of various 3D Models through Protrusion, revolve, shell sweep Creation of various features. Study of parent child relation. Feature based and Boolean based modeling surface and Assembly Modeling. Study of various standard Translators, Design simple components.
3. Manual part programming for CNC machines using standard G and M codes for a CNC LATHE
4. Part programming for Turning, Facing, Chamfering, Grooving, Step turning, Taper turning, Circular interpolation, Combination of few operations on CNC lathe
5. Part programming for Point to point motions, Line motions, Circular interpolation, Contour motion, Pocket milling- circular, rectangular, Mirror commands.
6. Part Programming uses Fixed or Canned Cycles for Drilling, Peck drilling, Boring, Tapping, Turning, Facing, Taper turning, Thread cutting.
7. Machining of small components using CNC LATHE & CNC MILLING MACHINE.
8. Exposure to computer assisted part programming – APT or other NC programming language.

Any Four Software Packages from the following for CAD:

CATIA, Pro-E, I-DEAS, UNIGRAPHICS, NISA, AUTOCAD, etc.

For CAM SOFTWARE: CNC TRAIN, GIBBS CAM, MASTER CAM

Note: (Minimum 12 Experiments to be conducted)

SYLLABI FOR
IV SEMESTER

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

ENVIRONMENTAL SCIENCE

Course Code: A2011

L	T	P	C
4	0	0	4

Course Overview:

Environmental study is interconnected; interrelated and interdependent subject. Hence, it is multidisciplinary in nature. The present course is framed by expert committee of UGC under the direction of Honourable Supreme Court to be as a core module syllabus for all branches of higher education and to be implemented in all universities over India. The course is designed to create environmental awareness and consciousness among the present generation to become environmental responsible citizens. The course description is: multidisciplinary nature of environmental studies, Natural Resources: Renewable and non-renewable resources; Ecosystems; Biodiversity and its conservation; Environmental Pollution; Social Issues and the Environment; Human Population and the Environment; pollution control acts and Field Work. The course is divided into five chapters for convenience of academic teaching followed by field visits.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Understand the character of environmental problems and ways of addressing them, including interactions across local to global scales.

CO2. Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.

CO3. Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies.

CO4. Appraise the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems

CO5. Evaluate the concepts and methods from ecological and physical sciences and their application in environmental problem solving.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

ENVIRONMENTAL SCIENCE

Course Code: A2011

L	T	P	C
4	0	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

COMPUTER ARCHITECTURE AND ORGANIZATION

Course Code: A2510

L	T	P	C
3	1	0	4

Course Overview:

This course will discuss the basic concepts of computer architecture and organization that can help the participants to have a clear view as to how a computer system works. Examples and illustrations will be mostly based on a popular Reduced Instruction Set Computer (RISC) platform. Illustrative examples and illustrations will be provided to convey the concepts and challenges to the participants. Starting from the basics, the participants will be introduced to the state-of-the-art in this field.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Analyze the computer fundamentals and computer internal organization.

CO2. Apply the register transfer operations and instructions in programs.

CO3. Evaluate the computer arithmetic algorithms.

CO4. Analyze the memory access operations and memory architecture.

CO5. Apply the multiprocessing in different inter process structures.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

COMPUTER ARCHITECTURE AND ORGANIZATION

Course Code: A2510

L	T	P	C
3	1	0	4

SYLLABUS

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 Dehi, 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 Jersy. Sivarama P.Dandamidi (2003), Fundomentals of Computer Organization and Design, Springer INT. Edition, USA.
3. John P. Hayes (1998), Computer Architecture and Organization, 3rd edition, Tata McGraw Hill, New

Delhi, India.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

FORMAL LANGUAGES AND AUTOMATA THEORY

Course Code: A2511

L	T	P	C
3	1	0	4

Course Overview:

Theory of Computation deals with the concepts of automata, formal languages, grammar, algorithms, computability, decidability, and complexity. The reasons to study Theory of Computation are Automata Theory provides a simple, elegant view of the complex machine that we call a computer. Automata Theory possesses a high degree of permanence and stability, in contrast with the ever-changing paradigms of the technology, development, and management of computer systems. Further, parts of the Automata theory have direct bearing on practice, such as Automata on circuit design, compiler design, and search algorithms; Formal Languages and Grammars on compiler design; and Complexity on cryptography and optimization problems in manufacturing, business, and management.

Prerequisite(s): Discrete Mathematical Structures
Data structures

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Acquire a fundamental understanding of the core concepts in automata theory and formal languages.
CO2. Design grammars and automata (recognizers) for different language classes.
CO3. Identify formal language classes and prove language membership properties.
CO4. Prove and disprove theorems establishing key properties of formal languages and automata.
CO5. Acquire a fundamental understanding of core concepts relating to the theory of computation and computational models including (but not limited to) decidability and intractability.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

FORMAL LANGUAGES AND AUTOMATA THEORY

Course Code: A2511

L	T	P	C
3	1	0	4

SYLLABUS

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 NFA, Equivalence of Deterministic and Nondeterministic Finite Automata, Application of Finite Language Automata of NFA, 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 CFG 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,

4.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

SOFTWARE ENGINEERING

Course Code: A2512

L	T	P	C
4	0	0	4

Course Overview:

This course acts as a foundation in the field of software engineering and is aimed at helping students develop an understanding of how software systems are developed from scratch, by guiding them through the development process, adopting the fundamental principles of system development. The course will orient the students to the different software process models, software requirements engineering process, systems analysis and design as a problem-solving activity, with focus on quality.

Prerequisite(s): Object Oriented Programming

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Identify the right process model to develop the right software system.

CO2. Gather requirements and analyze them scientifically in order to develop the right product, besides authoring software requirements document.

CO3. Propose design as per functional and non-functional requirements using design principles.

CO4. Propose testing strategies for application being developed.

CO5. Identify right set of umbrella activities for quality management and assurance.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

SOFTWARE ENGINEERING

Course Code: A2512

L	T	P	C
4	0	0	4

SYLLABUS

UNIT – I

INTRODUCTION TO SOFTWARE ENGINEEIRNG: The nature of software, Software engineering, 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.

UNIT – II

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

SYSTEM MODELING: Context Models, Interaction Models, Structural Models, Behavioral Models, 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, Capability Maturity Model Integration (CMMI).

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,
3. New Delhi, India.
4. Shely Cashman Rosenblatt (2006), *Systems Analysis and Design*, 6th edition, Thomson Publications, India.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

UNIX PROGRAMMING

Course Code: A2513

L	T	P	C
4	0	0	4

Course Overview:

This course will prepare students to develop software in and for Linux/UNIX environments. Topics to be covered include basic operating system concepts, effective command line usage, shell programming, the C language, programming development tools, system programming, network programming (client-server model and sockets), and GUI programming.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Understand Fundamental Network Design Principles.

CO2. Understand All the UNIX Utilities, and Implement Shell Scripting.

CO3. Differentiate Connection Oriented and Connection less Network Communication.

CO4. Understands the Concept of Process Threads and File Structure.

CO5. Design Various Client Server Applications Using TCP or UDP Protocols.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

UNIX PROGRAMMING

Course Code: A2513

L	T	P	C
4	0	0	4

SYLLABUS

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, rdir, 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

4. Networking API, 3rd edition, Volume 1, PHI Learning Private Limited India, New Delhi.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

DATABASE MANAGEMENT SYSTEMS

Course Code: A2514

L	T	P	C
3	1	0	4

Course Overview:

This course introduces the core principles and techniques required in the design and implementation of database systems. This course focus on relational database management systems, including database design theory: E-R modeling, data definition and manipulation languages, database security and administration. It also covers essential DBMS concepts such as: Transaction Processing, Concurrency Control and Recovery and various types of databases like distributed database, and intelligent database, Client/Server. Students undertake a semester project to design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS. It also provides students with theoretical knowledge and practical skills in the use of databases and database management systems in information technology applications.

Prerequisite(s): Object oriented Programming
Discrete Mathematical Structures

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Design and implement a database schema for a given problem domain.
CO2. Construct Queries in Relational algebra, relational calculus and SQL.
CO3. Apply Normalization techniques to reduce data redundancy in data base.
CO4. Analyze various transaction control and recovery methods to keep data base consistent.
CO5. Construct the file of data records by using appropriate storage and access structure.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

DATABASE MANAGEMENT SYSTEMS

Course Code: A2514

L	T	P	C
3	1	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

UNIX PROGRAMMING LAB

Course Code: A2515

L	T	P	C
0	0	3	2

Course Overview:

This course provides overview of UNIX environment and its architectural details. This course gives introduction to various UNIX commands related to file handling, security, networking etc. Working on BASH with shell scripting will be covered which are necessary to implement UNIX file structure. Also it covers the major concepts of inter process communications (IPC), which is the basis of all client / server applications under UNIX, Linux utilities. It also emphasizes various concepts in IPC and multithreaded programming and socket programming.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Work on utilities in Unix/Linux environment.

CO2. Write shell scripts to automate various tasks

CO3. Master the basics of linux administration

CO4. Learn the usage of various signal interrupt commands.

CO5. Learn the establishment of connection and communication between server and client.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

UNIX PROGRAMMING LAB

Course Code: A2515

L	T	P	C
0	0	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).

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

DATABASE MANAGEMENT SYSTEMS LAB

Course Code: A2516

L	T	P	C
0	0	3	2

Course Overview:

This course introduces the core principles and techniques required in the design and implementation of database systems. This course focuses on relational database management systems including data definition language, data manipulating languages. SQL is used to share and manage data, particularly the data that is found in relational database management systems - where the data is organized in tables, and where multiple files, each containing tables of data, may be related together by a common field. This course will cover the Oracle 10g PL/SQL programming language. Student will learn to control data sharing and learn to develop triggers, procedures, functions, cursors.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Design and implement a database schema for a given problem domain.

CO2. Formulate a query to retrieve information from database.

CO3. To implementation of database security and maintenance.

CO4. Normalize a database.

CO5. Applying enforce integrity constraints on a database.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE IV Semester **VCE-R14**

DATABASE MANAGEMENT SYSTEMS LAB

Course Code: A2516

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

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 is 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 SEMESTER

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

MICROPROCESSORS AND INTERFACING

Course Code: A2419

L	T	P	C
4	0	0	4

Course Overview:

Introduction to microprocessors and microcomputer-based applications. Interfacing architecture and peripheral interfaces. Introduction to Pentium processors and its functional units. Cache overview and code/data cache. Dual processors.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Apply the fundamentals of microprocessor & controller to investigate existing designs.

CO2. Compare & contrast the processor and controller for the implementation of real time applications.

CO3. Demonstrate assembly language programming proficiency to assemble and run on host machine.

CO4. Identify the required driver circuitry to microprocessor and controller I/O ports to interface external devices.

CO5. Design the required hardware & software modules and integrate to be a functional model.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

MICROPROCESSORS AND INTERFACING

Course Code: A2419

L	T	P	C
4	0	0	4

SYLLABUS

UNIT - I **(11 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 **(13 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.

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

UNIT – III **(12 Lectures)**

8086 DIGITAL IO 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.

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

UNIT - IV **(10 Lectures)**

ADVANCED MICROPROCESSORS: Introduction to 80286, salient features of 80386.

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.

UNIT – V **(10 Lectures)**

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

8051 SERIAL DATA TRANSFER SCHEMES: Asynchronous and synchronous data transfer schemes, RS - 232C Serial data standard, RS - 423A and RS - 422A, sample program of serial data transfer, Design examples.

Text Books:

1. Douglas V. Hall (2007), *Microprocessors Interface*, 2nd edition, Tata McGraw Hill, New Delhi.

Reference Books:

1. Walter A. Triebel, Avtar Singh (2003), *The 8088 and 8086 Microprocessors* 4th edition, Prentice Hall of India, New Delhi.
2. Mazidi (2000), *The 8051 Microcontroller and Embedded System*, Prentice Hall of India, New Delhi.
3. Deshmukh (2004), *Microcontrollers*, Tata McGraw Hill Edition, New Delhi.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

COMPUTER NETWORKS

Course Code: A2602

L	T	P	C
3	1	0	4

Course Overview:

The growing importance of Internetworking in recent years and their use in every field has made Computer Networks a central issue for modern systems. The course introduces the basic concepts of networks. The main objective of the course is to enable students to know the functions of various layers of a network model. Topics covered in the course include Introduction to networks, Physical layer, Data link layer, Medium access sub layer, Network layer, Transport layer and Application layer.

Prerequisite(s):

- Computer Organization and Microprocessors
- Operating Systems

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. To understand the terminology and concepts of OSI reference model and the TCP/IP reference model and functions of each layer.

CO2. To identify the different types of network topologies, protocols, network devices and their functions within a network

CO3. To master the concepts of protocols, networks interfaces, and design/performance issues in LAN and WAN

CO4. To understand and building the skills of sub netting and routing mechanisms, familiarity with basic protocols of computer networks and how they can be used to assist in network design and implementation.

CO5. Specify and identify deficiencies in existing protocols, and then go on to formulate new and better protocols.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

COMPUTER NETWORKS

Course Code: A2602

L	T	P	C
3	1	0	4

SYLLABUS

UNIT I **(10 Lectures)**

INTRODUCTION: Network applications, Network hardware, Network software, Reference models: OSI, TCP/IP, 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 UD**(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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

WEB TECHNOLOGIES

Course Code: A2603

L	T	P	C
3	1	0	4

Course Overview:

This course introduces students to fundamental web technologies such as HTTP, CSS, XML, PHP and Server-side scripting. The course teaches students how to use some of these technologies to develop static and dynamic web pages with an emphasis on client-side scripts. The course explains the differences between client-side and server-side Web development, and how to build simple applications using servlets, jsp and JDBC. The course also covers current Web "standards" and future W3C recommendations.

Prerequisite(s):

- Computer Programming
- Object Oriented Programming

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Apply various HTML tags used to design static web pages.

CO2. Apply CSS and JavaScript Constructs to perform Client side validation and designing of dynamic web pages.

CO3. Apply various PHP construct to develop server side applications and also familiar of transporting data among applications using XML.

CO4. Understand how to configure Web servers and deployment of applications.

CO5. Create server side; Database and MVC based applications using Servlet, JSP and JDBC.

C06. Understand Handling of asynchronous requests using AJAX programming.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

WEB TECHNOLOGIES

Course Code: A2603

L	T	P	C
3	1	0	4

SYLLABUS

This course is designed in collaboration with Infosys Technologies Limited.

UNIT – I **(15 Lectures)**

INTRODUCTION TO WEB TECHNOLOGY: 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

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

UNIT – II **(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/

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

MOBILE APPLICATION DEVELOPMENT

Course Code: A2604

L	T	P	C
4	0	0	4

Course Overview:

The latest mobile devices and applications are changing the way we communicate, do business, and access news and entertainment. Businesses, consumers and programmers have embraced this innovative medium, making mobile application developer one of the most demanded and fastest growing IT career paths. This course teaches students how to build mobile apps for Android mobile operating platform. Students learn to write native apps for Android based devices using Eclipse and the Android SDK. Students are expected to work on a project that produces a professional-quality mobile application. Projects will be deployed in real-world applications.

Prerequisite(s):

Object Oriented Programming, Web Technologies

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Analyze architecture, the ecosystem, features and tools to design mobile applications.
CO2. Create effective user interfaces that leverage evolving mobile device capabilities.
CO3. Design, customize and enhance mobile applications with various widgets.
CO4. Experiment with different application components to design various user friendly mobile applications
CO5. Build database and server-side applications to provide complete mobile development solutions.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

MOBILE APPLICATION DEVELOPMENT

Course Code: A2604

L	T	P	C
4	0	0	4

SYLLABUS

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 Word, 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.
4. "Mobile Design and Development", "O'Reilly ", 2009 .

WEB RESOURCES:

1. Developer.android.com

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

COMPILER DESIGN

Course Code: A2517

L	T	P	C
3	1	0	4

Course Overview:

This course deals with the theory and practice of compiler design Introduction to compiling, structure of simple one-step compilers: syntax and lexical analysis, parsing, introduction to type checking, intermediate code generation, introduction to code generation and optimization. Discussion about tools for compilers design (e.g. Lex and Yacc).

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Implement lexical analyzer from a specification of language lexical rules.

CO2. Analyze various parsing technique to parse a string effectively.

CO3. Apply SDT for various transformations of programming language constructs.

CO4. Apply type checking rules to implement semantic analyzer.

CO5. Analyze various code optimization techniques to improve the performance of programming.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

COMPILER DESIGN

Course Code: A2517

L	T	P	C
3	1	0	4

SYLLABUS

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 (2006), *compiler - Principles design*, Techniques and Tools, 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

PRINCIPLES OF PROGRAMMING LANGUAGES

Course Code: A2518

L	T	P	C
4	0	0	4

Course Overview:

This course focuses on high-level programming languages and their formal semantics. Such study enables precise reasoning about programs, their efficient implementation and easy reuse, as will be discussed in the course. The course includes axiomatic semantics, imperative programming languages, functional programming languages, object-oriented programming languages, logic programming languages, and higher-level languages with sets and maps. The course also includes topics like type systems, abstraction mechanisms, declarativeness, efficient implementations, concurrency and parallelism.

Prerequisite(s): Object Oriented Programming

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Analyze the designing criteria of different programming languages to choose appropriate language for implementation of real time applications.

CO2. Identify appropriate primitive/user defined data types for increasing program efficiency.

CO3. Apply sub program concepts to improve the readability of the program.

CO4. Analyze different object oriented programming features and to apply in developing efficient web programs with concurrent ability.

CO5. Apply exception handling techniques to develop robust programs to sustain against all runtime exceptions.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

PRINCIPLES OF PROGRAMMING LANGUAGES

Course Code: A2518

L	T	P	C
4	0	0	4

SYLLABUS

UNIT-I: **(15 Lectures)**

Preliminary Concepts: Reasons for studying concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories– Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments.

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, axiomatic semantics for common programming language features.

UNIT-II: **(09 Lectures)**

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

UNIT-III: **(14 Lectures)**

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, and guarded commands.

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

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

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95 Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

UNIT-V: **(12 Lectures)**

Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java. Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

TEXT BOOKS:

1. Robert .W. Sebesta (2010), Concepts of Programming Languages, 10/e, Pearson Education, New Delhi, India.
2. D. A. Watt (2007), Programming Language Design Concepts, Wiley dreamtech, New Delhi, India.

REFERENCE BOOKS:

1. A.B. Tucker, R.E. Noonan (2007), Programming Languages, 2nd Edition, TMH, New Delhi, India.
2. K. C.Louden (2003), Programming Languages, 2nd Edition, Thomson, New Delhi, India.
3. Patric Henry Winston and Paul Horn (1989), LISP, Pearson Education, New Delhi, India.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

MICROPROCESSORS AND INTERFACING LAB

Course Code: A2424

L	T	P	C
0	0	3	2

Course Overview:

This course provides a comprehensive introduction to microprocessors, microcontrollers (8051) and their architectures with an emphasis on its interfacing with external devices. Focus is on 8086 microprocessor family which includes internal architecture, pin diagram, instruction set, register organization, addressing modes, operating modes, interrupt structure, assembly language programming and etc. Various aspects of hardware design, such as interfacing of memory and different types of I/O devices will be covered in detailed. It also emphasis on 8051 microcontroller, different interfaces and data transfer schemes. The course is accompanied by laboratory experiments directly linked to the lecture topics for hands-on learning of the material. This course will be useful to students as a first level course for embedded systems.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Describe the interaction between CPU, memory and I/O ports in various applications.

CO2. Master the assembly level programming language using 8086 instruction set.

CO3. Analyze how different I/O devices can be interfaced to processor and will explore several Techniques of interfacing.

CO4. Design a simple microprocessor based system with functional requirements for hardware and Software components for few input and output devices.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

MICROPROCESSORS AND INTERFACING LAB

Course Code: A2424

L	T	P	C
0	0	3	2

LIST OF 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.

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, 2nd Edition, PHI, India.
3. Walter A.Triebel, Avtar Singh (2003), the 8088 and 8086 Microprocessors 4th Edition, PHI, India.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

WEB TECHNOLOGIES LAB

Course Code: A2606

L	T	P	C
0	0	3	2

Course Overview:

Presenting information over the internet in form of web pages is the best way of reaching to all corners of world. This laboratory aims at giving knowledge about creating web pages and also about different web programming concepts, technologies.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Analyze and create web pages using languages like HTML, DHTML, CSS, PHP and JavaScript.

CO2. Design XML Schema and create XML documents and Java Beans.

CO3. Use server side components like Servlets to build dynamic websites.

CO4. Create websites using server-side components using JSP.

CO5. Design and construct various data base tables using JDBC and produce various results based on given query.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE V Semester **VCE-R14**

WEB TECHNOLOGIES LAB

Course Code: A2606

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

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.
3. Hans Bergsten(2003), "Java Server Pages", 3rd Edition, SPD O'Reilly.

SYLLABI FOR
VI SEMESTER

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

EMBEDDED SYSTEMS

Course Code: A2425

L	T	P	C
4	0	0	4

Course Overview:

In this course, the fundamentals of embedded system hardware and firmware design will be explored. Issues such as embedded processor selection, hardware/firmware partitioning, glue logic, circuit design, circuit layout, circuit debugging, development tools, firmware architecture, firmware design, and firmware debugging will be discussed. The Intel 8051, a very popular microcontroller, will be studied. The architecture and instruction set of the microcontroller will be discussed, and a wire wrapped microcontroller board will be built and debugged by each student. The course will culminate with a significant final project which will extend the base microcontroller board completed earlier in the course. Learning may be supplemented with periodic guest lectures by embedded systems engineers from industry. Depending on the interests of the students, other topics may be covered.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Apply an appropriate software tools to provide an interface between hardware peripherals and systems.

CO2. Interpret the need for RISC type computing system for advanced embedded applications.

CO3. Design the subsystems and integrate for a complete system to perform complex tasks.

CO4. Develop a product with functional requirements using optimal hardware and software components.

CO5. Identify a suitable firmware to meet real time computing constraints of an embedded system.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

EMBEDDED SYSTEMS

Course Code: A2425

L	T	P	C
4	0	0	4

SYLLABUS

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, Why 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.

5OTHER 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

NETWORK SECURITY AND CRYPTOGRAPHY

Course Code: A2607

L	T	P	C
3	1	0	4

Course Overview:

Cryptography is an indispensable tool for protecting information in computer systems. In this course you will learn the inner workings of cryptographic systems and how to correctly use them in real-world applications. The course begins with a detailed discussion of how two parties who have a shared secret key can communicate securely when a powerful adversary eavesdrops and tampers with traffic. We will examine many deployed protocols and analyze mistakes in existing systems. The second half of the course discusses public-key techniques that let two parties generate a shared secret key.

Prerequisite(s): Computer Networks(2602), Discrete Mathematics (A2505)

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Analyze the different Security Attacks, Services, and Mechanisms work security models. (Analyze)

CO2. Apply classical encryption algorithms (Substitution and Transposition ciphers) and DES algorithms to encrypt plaintext (Apply).

CO3. Distinguish the modern Cryptography algorithm such as DES, AES, double DES, Triple DES, RC4 algorithm and analyze modern cryptanalysis techniques.(Analysis)

CO4. Solve the problem on public key cryptography techniques (RSA) and key management algorithms (Diffie-Hellman) (Apply)

CO5. Compare and contrast message authentication algorithms (SHA-512, MAC, HMAC), symmetric and asymmetric encryption and authentication standards and protocols (Analyze)

CO6. Examine the different network security protocols (IPSec, TLS/SSL, SET, S/MIME, PGP) and Firewall types and principles (Analyze)

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

NETWORK SECURITY AND CRYPTOGRAPHY

Course Code: A2607

L	T	P	C
3	1	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

OPEN SOURCE TECHNOLOGIES

Course Code: A2608

L	T	P	C
3	1	0	4

Course Overview:

This course will address the need for vertical open standards, domain knowledge and open source software skills for various industry verticals and drive to reduce the gap between industry requirement and availability of technical professionals for the same. This course provides the student with the insights into the world of open source software. Student will learn the Open source technologies like PHP, Jquery, Python, MySQL technologies which helps him in developing applications (software) as part of project work and makes him industry ready.

Prerequisite(s): Object Oriented Programming (A2508), Web Technologies (A2603), and Database Management Systems (A2514).

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Apply different LINUX system calls to handle process and signal management.

CO2. Implement web based applications using MySQL and PHP.

CO3. Use AJAX and JQuery technologies to handle web pages asynchronously.

CO4. Develop console based applications using Python and PERL language semantics.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

OPEN SOURCE TECHNOLOGIES

Course Code: A2608

L	T	P	C
3	1	0	4

SYLLABUS

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 – Kernal 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

ARTIFICIAL INTELLIGENCE

Course Code: A2519

L	T	P	C
4	0	0	4

Course Overview:

Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviors on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously. Although AI has been studied for more than half a century, we still cannot make a computer that is as intelligent as a human in all aspects. However, we do have many successful applications. In some cases, the computer equipped with AI technology can be even more intelligent than us. The Deep Blue system which defeated the world chess champion is a well-know example.

The main research topics in AI include: problem solving, reasoning, planning, natural language understanding, computer vision, automatic programming, machine learning, and so on. Of course, these topics are closely related with each other. For example, the knowledge acquired through learning can be used both for problem solving and for reasoning. In fact, the skill for problem solving itself should be acquired through learning. Also, methods for problem solving are useful both for reasoning and planning. Further, both natural language understanding and computer vision can be solved using methods developed in the field of pattern recognition.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Learn how to build the intelligent agents such as search, games, logic, constraint satisfaction problems
CO2. Apply knowledge to translate the English into first order logic and vice versa.
CO3. Find appropriate idealizations for converting real world problems into AI search problems formulated using the appropriate search algorithm
CO4. Analyze constraint satisfaction problems and conflict based problems.
CO5. Describe about planning and learning algorithms to solve the real world problems

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

ARTIFICIAL INTELLIGENCE

Course Code: A2519

L	T	P	C
4	0	0	4

SYLLABUS

UNIT-I **(10 Lectures)**

Introduction: AI problems, foundation of AI and history of AI, Intelligent agents: Agents and Environments, The concept of rationality, The nature of environments, Structure of agents, Problem solving agents, Problem formulation.

UNIT-II **(12 Lectures)**

Knowledge Representation & Reasons: Knowledge – Based Agents, The Wumpus world.

Propositional Logic: Reasoning patterns in propositional logic - Resolution, Forward & Backward Chaining. **Inference in First order logic:** Propositional vs. first order inference, Unification & lifting, Forward chaining, Backward chaining, Resolution.

UNIT-III **(14 Lectures)**

Searching: Searching for solutions, uniformed search strategies – Breadth first search, depth first search, Depth limited search, Iterative deepening depth first search bi-direction search, Comparing uninformed search strategies. Search with partial information (Heuristic search), Greedy best first search, A* search, Memory bounded heuristic search, Heuristic functions.

Local search Algorithms: Hill climbing, Simulated annealing search, Local beam search, Genetic algorithms.

UNIT-IV **(10 Lectures)**

Constrain satisfaction problems: Backtracking search for CSPs local search for constraint satisfaction problems. **Game Playing**: Games, Minimax algorithm, Optimal decisions in multiplayer games, Alpha-Beta pruning, Evaluation functions, Cutting of search.

UNIT-V **(13 Lectures)**

Planning: Classical planning problem, Language of planning problems, Expressiveness and extension, planning with state – space search, Forward state spare search, Backward state space search, Heuristics for state space search, Partial order planning Graphs, Planning graphs

LEARNING: what is learning, Forms of learning, Inductive learning, Learning Decision Trees.

TEXT BOOKS:

1. Stuart Russel, Peter Norvig, (2009), Artificial Intelligence – A Modern Approach,3rd Edition, Pearson Education.

REFERENCE:

1. E.Rich and K.Knight, (2008), Artificial Intelligence , 3rd Edition, Tata McGraw Hill.
2. Patterson, (2009), Artificial Intelligence and Expert Systems, 2nd Edition, PHI.
3. Giarrantana/ Riley, (2004), Expert Systems: Principles and Programming,4th Edition, Thomson.
4. Ivan Bratka, (2000), PROLOG Programming for Artificial Intelligence. 3rdEdition – Pearson Education.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

OBJECT ORIENTED ANALYSIS AND DESIGN

Course Code: A2520

L	T	P	C
3	1	0	4

Course Overview:

This course teaches students the basic principles of object orientation and OO analysis and design. We will use the Unified Process and the Unified Modeling Language (UML) as tools.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Possess an ability to practically apply knowledge software engineering methods, such as object - oriented analysis and design methods with a clear emphasis on UML.

CO2. Have a working ability and grasping attitude to design and conduct object oriented analysis and design experiments using UML, as well as to analyze and evaluate their models.

CO3. Have a capacity to analyze and design software systems, components to meet desired needs.

CO4. Show ability to form and work on multi-disciplinary teams that are able to perform multiple - faceted tasks from domain analysis and understanding to design and develop software systems based on object-oriented thinking. This may also provide an ability to communicate their models and solutions in an effective manner.

CO5. Display an ability to identify, formulate and solve software development problems: software requirements, specification (problem space), software design, and implementation (solution space).

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

OBJECT ORIENTED ANALYSIS AND DESIGN

Course Code: A2520

L	T	P	C
3	1	0	4

SYLLABUS

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 STRUCURAL 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.

List of Text Books / References / Websites / Journals / Others

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Atul Kahate(2004), “Object Oriented Analysis and Design” Tata Mcgraw-hill education.
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”.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

MANAGEMENT SCIENCE
(Interdepartmental Elective - I)

Course Code: A2013

L	T	P	C
4	0	0	4

Course Overview:

The course introduces the basic concepts of Management Science and Operations Management and its application to business. The topics include project management, forecasting, inventory management, cost-benefit analysis and decision-making. The course develops problem solving and spreadsheet skills, an invaluable tool for modern business.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Understand the core concepts of Management Science and Operations Management;
CO2. Use mathematical tools and techniques to aid decision-making and planning;
CO3. Understand the disciplines of Management Science and Operations Management and their role in business and other decision-making
CO4. Gain an overview of the process of developing and using quantitative techniques in decision making and planning
CO5. Interpret the outcome of quantitative techniques to gain insights which could be applied to different context of interest

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

MANAGEMENT SCIENCE
(Interdepartmental Elective - I)

Course Code: A2013

L	T	P	C
4	-	-	4

SYLLABUS

UNIT I **(12 Lectures)**

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 **(12 Lectures)**

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 **(12 Lectures)**

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 **(12 Lectures)**

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 **(15 Lectures)**

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

REFERENCES:

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

HUMAN RESOURCE MANAGEMENT
(Interdepartmental Elective - I)

Course Code: A2016

L	T	P	C
4	-	-	4

Course Overview:

This course examines the role of the human resource professional as a strategic partner in managing today?s organizations. Key functions such as recruitment, selection, development, appraisal, retention, compensation, and labor relations are examined. Implications of legal and global environments are appraised and current issues such as diversity training, sexual harassment policies, and rising benefit costs are analyzed. Best practices of employers of choice are considered.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes.
CO2. Administer and contribute to the design and evaluation of the performance management program.
CO3. Develop, implement, and evaluate employee orientation, training, and development programs.
CO4. Facilitate and support effective employee and labour relations in both non-union and union environments.
CO5. Research and support the development and communication of the organization's total compensation plan.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

HUMAN RESOURCE MANAGEMENT
(Interdepartmental Elective - I)

Course Code: A2016

L	T	P	C
4	-	-	4

SYLLABUS

UNIT – I **(15 Lectures)**

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 **(12 Lectures)**

JOB ANALYSIS AND RECRUITMENT: Process and Sources of Recruitment; Selection, process of selection and techniques, Retention of Employees.

UNIT – III **(13 Lectures)**

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 **(12 Lectures)**

COMPENSATION MANAGEMENT: Concepts and components of wages, Factors influencing wage fixation, Job evaluation, Methods of payment, Incentives and Fringe benefits.

UNIT – V **(13 Lectures)**

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

BASIC ENTREPRENEURSHIP
(Interdepartmental Elective - I)

Course Code: A2017

L	T	P	C
4	-	-	4

Course Overview:

The Students are able to understand the entrepreneurship styles, able to identify their flow. The Students ability to generate ideas through mind mapping, DISTRUP model and evaluate the generated ideas. The effectuation principles helps the students to understand the expertise of expert entrepreneurs in dealing with entrepreneurial activities. The concept of Value Proposition canvas helps the identify customer segment and value proposition to address the customer problems. The Minimum Viable Product (MVP) is validated through Test card, learning card with the help of Prototypes.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Ability to self-discover about their interests and passion towards entrepreneurial Journey

CO2. Identify and evaluate the ideas through DISRUPT Model and techniques to evaluate the best idea.

CO3. Ability to understand the effectuation principles to startup the venture.

CO4. Identify customers and create value proposition for the entrepreneurship.

CO5. Demonstrate the prototype of the idea towards the entrepreneurial venture.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

BASIC ENTREPRENEURSHIP
(Interdepartmental Elective - I)

Course Code: A2017

L	T	P	C
4	-	-	4

SYLLABUS

UNIT – I **(15 Lectures)**

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 **(12 Lectures)**

INSTITUTIONAL SUPPORT: Role of Government; Role of IDBI, SIDBI, SIDO, NIESBUD, SISI, DIC, Entrepreneurship Development Institute, MSMEs.

UNIT – III **(10 Lectures)**

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 **(13 Lectures)**

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 **(10 Lectures)**

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

BUSINESS COMMUNICATION
(Interdepartmental Elective - I)

Course Code: A2018

L	T	P	C
4	-	-	4

Course Overview:

The aim of this course is to develop students communication skills in the English language that will enable them to function effectively in a business environment. The course content focuses on selected written and oral forms of communication related to topics and issues critical to students of Business Studies.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Apply business communication strategies and principles to prepare effective communication for domestic and international business situations.

CO2. Participate in team activities that lead to the development of collaborative work skills.

CO3. Select appropriate organizational formats and channels used in developing and presenting business messages.

CO4. Communicate via electronic mail, Internet, and other technologies.

CO5. Deliver an effective oral business presentation.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

BUSINESS COMMUNICATION
(Interdepartmental Elective - I)

Course Code: A2018

L	T	P	C
4	-	-	4

SYLLABUS

UNIT – I **(14 Lectures)**

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 **(13 Lectures)**

NONVERBAL COMMUNICATION: Body Language, Gestures, Postures, Facial Expressions, Dress Code. Listening and Speaking Skills, Probing questions, Observation, Business and Social etiquette.

UNIT – III **(12 Lectures)**

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 **(14 Lectures)**

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, Videoconferencing.

UNIT – V **(12 Lectures)**

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.

EFERENCE 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

PROJECT PLANNING AND MANAGEMENT
(Interdepartmental Elective - I)

Course Code: A2019

L	T	P	C
4	-	-	4

Course Overview:

The focus of the course lies on how to plan, start, lead and complete projects. A central element is that the course participants develop own project plans in groups. A such should include all necessary components such as a project description, specification of target group, possible financiers, time plan, and budget.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. The discipline of project and programme management, within an overall appreciation of the nature and purpose of projects

CO2. The principles and practice of project planning, design, preparation, and appraisal techniques for projects in a development context

CO3. The theory and practice of management skills for project and programme management, focusing particularly on 'hard' and 'soft' skills for successful project implementation

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

PROJECT PLANNING AND MANAGEMENT
(Interdepartmental Elective - I)

Course Code: A2019

L	T	P	C
4	-	-	4

SYLLABUS

UNIT – I **(10 Lectures)**

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 **(13 Lectures)**

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 **(12 Lectures)**

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 **(12 Lectures)**

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 **(14 Lectures)**

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,

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

ORGANIZATIONAL BEHAVIOR
(Interdepartmental Elective - I)

Course Code: A2020

L	T	P	C
4	-	-	4

Course Overview:

This course integrates the study of management principles and practices with the study of human behavior within organizations. The focus will be upon translation of management and organizational behavior theory to practices that result in organizational effectiveness, efficiency, and human resource development. The primary goal of this course is to prepare students for advanced leadership roles in modern organization. This course will provide a good foundation for students intending to study in any major, as the main objective of this course is to provide students with the essential content and experiences they need to become a motivating student, successful manager and an effective employee in any type of work they do in the future. By taking the course students will understand themselves and other people at work and will be able to learn how to create effective work groups to be successful in life.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. List and define basic organizational behaviour principles, and analyze how these influence behaviour in the workplace.

CO2. Analyze individual human behaviour in the workplace as influenced by personality, values, perceptions, and motivations.

CO3. Outline the elements of group behaviour including group dynamics, communication, leadership, power & politics and conflict & negotiation.

CO4. Understand your own management style as it relates to influencing and managing behaviour in the organization systems.

CO5. Enhance critical thinking and analysis skills through the use of management case studies, personal application papers and small group exercises.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

ORGANIZATIONAL BEHAVIOR
(Interdepartmental Elective - I)

Course Code: A2020

L	T	P	C
4	-	-	4

SYLLABUS

UNIT - I **(13 Lectures)**

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 **(12 Lectures)**

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 **(12 Lectures)**

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 **(14 Lectures)**

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 **(11 Lectures)**

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 Deepak Kumar Bhattacharyya (2012), *Principles of Management-text and cases*, Pearson.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

OPEN SOURCE TECHNOLOGIES LAB

Course Code: A2609

L	T	P	C
0	0	3	2

Course Overview:

This Laboratory is meant to make the students to learn efficient open source programming languages. Open Source Technologies is a subject of primary importance to the discipline of Information Technology. Comprehensive hands on exercises are integrated throughout to reinforce learning and develop real competency. Students are introduced to all major Open Source Programming languages to develop various applications

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Demonstrate an ability to design and develop Web based programs, analyze, and interpret object oriented data and report results.

CO2. Develop confidence for self-education and ability for life-long learning needed for other open source languages and can participate and succeed in competitive examinations like Engineering services, exit interviews etc.

CO3. Solve computer software problems by writing customized programs in an efficient way using python Language.

CO4. Demonstrate an ability to design and develop PHP based novel products.

CO5. Exhibit profound knowledge to create, debug, and execute scripting programs using JQuery, AngularJS.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

OPEN SOURCE TECHNOLOGIES LAB

Course Code: A2609

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

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 upload image to MySQL database with PHP
2. Write a program to create a ZIP file using

PHP Week 4:

1 Write a program for PHP

Pagination 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

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 Week 10:

1. Write a program for string manipulation using Perl
2. 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

OBJECT ORIENTED ANALYSIS AND DESIGN LAB

Course Code: A2521

L	T	P	C
-	-	3	2

Course Overview:

This course teaches students the basic principles of object orientation and OO analysis and design. We will use the Unified Process and the Unified Modeling Language (UML) as tools.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Master key principles in Object Oriented analysis design and development.

CO2. Be familiar with the application of the Unified Modeling Language (UML) towards analysis and design.

CO3. Be familiar with alternative development processes.

CO4. Apply design principles.

CO5. Identify and apply key principles, rules, and heuristics in Object Oriented analysis and design apply UML 2.0

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VI Semester **VCE-R14**

OBJECT ORIENTED ANALYSIS AND DESIGN LAB

Course Code: A2521

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS

LAB CASE STUDIES

Students are divided into batches of 4 each and each batch has to draw the following diagrams using UML for the given case studies.

UML diagrams to be developed are:

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

CASE STUDY 1: AUTOMATED TELLER MACHINE (ATM)

Description for an ATM System

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned

- except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back. If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction. The ATM will provide the customer with a printed receipt for each successful transaction The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer. When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.

CASE STUDY 2: ONLINE BUS TICKET RESERVATION SYSTEM

Our Bus Travel Facility is provides Online Bus ticket Reservation System. In our System we can provides different types of buses categories like Express, Volvo, AC or Non AC etc .In our system we can manage all types of Passenger data & bus data. All details that is related to Travelling like fare details, Seat availability, details of Booking bus details, seating arrangements, inquiry etc. In our system we can provide the features to the passenger like the passenger could choose the available seats Own itself that is not provided by any other Agency. Our system also provides the facility like the Bus Boarding and the admin has facility to send Email & SMS.

Description for ONLINE BUS TICKET RESERVATION SYSTEM

Our Travel System provides the transportation facility to the customers based on their requirement. They provide different types of buses like Express, Luxury, and Volvo has two types – A/C and Non A/C. The charges are different for different buses. The charges also depend on the distance the customer wants to travel. They maintain all the records of the bus reservation counter though online service itself but the application is only accessed by the Admin. Until Now they used to issue the tickets in the buses alone it is difficult to track the details of the bookings done as it provides the service all over the State.

Our Travel Agencies manage their data on standalone system that is not enough to track down the information of the all bookings in the state. That we are develop the Online Bus Ticket Reservation System, it is capable to book online ticket. Present system is not capable to maintained data on state side. we have produced the online system that is capable to manage the data of the bus booking details on the state level. User of this system can able to operate this system anywhere in country, and booking of the bus ticket on single click. System has able to manage the bus details and update the information just on click, system does very efficiency manage that type of data. It is also capable to manage the details about fare of the bus, source and destination details. That the system is also able to manage the details of the passenger and their charges details and booking details separately.

Our system also provides the facility like the Bus Boarding and the admin has facility to send Email & SMS. And Also

1. Check the whether of user is valid or invalid.
2. Admin should manage the details of bus.
3. Admin should manage the details of customer.
4. Admin should manage the bus fare and passenger details.
5. Booking process complete by only system user.

6. User should print the booked ticket.

TEXT BOOK:

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".

SYLLABI FOR
VII SEMESTER

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

CLOUD COMPUTING

Course Code: A2611

L	T	P	C
4	0	0	4

Course Overview:

Cloud computing is a computing paradigm, where is a large pool of systems are connected in private or public networks, to provide dynamically scalable infrastructure for application, data and file storage. With the advent of this technology, the cost of computation, application hosting, content storage and delivery is reduced significantly. This course covers all the above topics.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. **Understand** the architecture, service, deployment models, and infrastructure models of cloud computing.
CO2. **Describe** the common terms and definitions of Virtualization, Hypervisor, benefits of virtualization and other cloud computing concepts with some examples.
CO3. **Categorize** various cloud deployment, delivery models and virtualization techniques with their technical capabilities.
CO4. **Develop** a plan for migrating an application to the cloud.
C05: Evaluate open source cloud computing software, and free/commercial cloud services.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

CLOUD COMPUTING

Course Code: A2611

L	T	P	C
4	0	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

CYBER SECURITY

Course Code: A2612

L	T	P	C
3	1	0	4

Course Overview:

This course drawing upon a wealth of experience from academia, industry, and government service, *Cyber Security* details and dissects, in current organizational cyber security policy issues on a global scale—taking great care to educate students on the history and current approaches to the security of cyberspace. It includes thorough descriptions—as well as the pros and cons—of an excess of issues, and document policy alternatives for the sake of clarity with respect to policy alone. It also delves into organizational implementation issues, and equips students with descriptions of the positive and negative impact of specific policy choices.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. **Analyze** cyber attack on different online web applications

CO2**. Apply** different techniques to classify different types of cybercrimes.

CO3. **Understand** different government cyber laws and cyber forensics techniques and how CO4. To protect them self and ultimately society from cyber attacks.

CO4. **Describe** and analyze the hardware, software, components of a network and the interrelations.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

CYBER SECURITY

Course Code: A2612

L	T	P	C
3	1	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

SOFTWARE PROJECT MANAGEMENT

Course Code: A2522

L	T	P	C
4	0	0	4

Course Overview:

The conventional model performance and pitfalls, Software economic parameters, Software development lifecycle stages and phases, Artifacts and work flows of the process, Check points of the process(Milestones),Roles and Responsibilities of Management and Technical people, Tailoring of the project, Monitoring and controlling of process status using Metrics, Future software project management.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion o

f this course, student will be able to:

CO1. Identify the basic concepts and issues of software project management, Parameters to be considered to improve the software economics.

CO2. Apply SDLC methodology for development and identification of artifacts for each lifecycle phases.

CO3. Apply activities necessary to successfully complete and close the software projects using all the checkpoints in development process.

CO4. Apply the metrics for assessing the quality and cost; Acquire knowledge about automation building blocks and organization structure.

CO5. Identify the elements of tailoring process and future software project management long with case study (CCPDS).

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

SOFTWARE PROJECT MANAGEMENT

Course Code: A2522

L	T	P	C
4	0	0	4

SYLLABUS

UNIT - I **(14 Lectures)**

SOFTWARE EFFORTS ESTIMATION TECHNIQUES: 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 discriminants.

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.
   Joel Henry (2003), Software Project Management, Pearson Education, India.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

DATA MINING AND DATA WAREHOUSING

Course Code: A2523

L	T	P	C
3	1	0	4

Course Overview:

The course addresses the concepts, skills, methodologies, and models of data warehousing. The course addresses proper techniques for designing data warehouses for various business domains, and covers concepts for potential uses of the data warehouse and other data repositories in mining opportunities. Data mining, the extraction of hidden predictive information from large databases, is a powerful new technology with great potential to help companies focus on the most important information in their data warehouses. Data mining tools predict future trends and behaviours, allowing businesses to make proactive, knowledge-driven decisions.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Exhibit solid foundation of Data Mining and Data warehousing fundamental concepts to cater the needs of data analytics.

CO2. Identify and Categorize the types of data, kinds of patterns, association rules, classification methods and develop skillset to implement the mining techniques.

CO3. Assess the strengths and weaknesses of the data mining algorithms and analyze their behavior on real datasets.

CO4. Compare between OLTP and OLAP, Descriptive and Predictive Analytics, clustering and apply them as per needs and specifications of the problem statements.

CO5. Apply clustering techniques and outlier detection methods.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

DATA MINING AND DATA WAREHOUSING

Course Code: A2523

L	T	P	C
3	1	0	4

SYLLABUS

UNIT – I **(12 lectures)**

INTRODUCTION TO DATA MINING: Motivation, Importance, Definition of Data Mining, Kinds of Data Mining, Kinds of Patterns, Data Mining Technologies, Kinds of Applications Targeted, Major issues in Data Mining.

PREPROCESSING: Data Objects and Attribute Types, Basic Statistical Descriptions of Data, Data Visualization, Data Quality, Data Cleaning, Data Integration, Data Reduction, Data Transformation and Data Discretization.

UNIT – II **(12 lectures)**

DATA WAREHOUSING AND ONLINE ANALYTICAL PROCESSING: Data Warehouse basic concepts, Data Warehouse Modeling: Data Cube and OLAP, Data Warehouse Design and Usage, Data Warehouse Implementation, Data Generalization by Attribute-Oriented Induction.

DATA CUBE TECHNOLOGY: Data Cube Computation: Preliminary Concepts, Data Cube Computation Methods, Multidimensional Data Analysis in Cube Space.

UNIT – III **(10 lectures)**

MINING FREQUENT PATTERNS, ASSOCIATIONS AND CORRELATIONS: Basic Concepts, FrequentItemset Mining Methods, Pattern Evaluation Methods, Pattern Mining in Multilevel, Multidimensional Space, Constraint-Based Frequent Pattern Mining.

UNIT – IV **(12 lectures)**

CLASSIFICATION: Basic Concepts, Decision Tree Induction, Bayes Classification Methods, Rule-Based Classification, Model Evaluation and Selection, Techniques to Improve Classification Accuracy, Classification by Back propagation, Support Vector Machines, Associative Classification, Lazy Learners, Other Classification Methods.

UNIT – V **(12 lectures)**

CLUSTER ANALYSIS: Basic Concepts of Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid – Based Methods, Probabilistic Model-Based Clustering, Clustering High-Dimensional Data.

OUTLIER DETECTION: Outliers and Outlier Analysis, Outlier Detection Methods, Statistical Approaches, Proximity-

Based Approaches, Clustering-Based Approaches, Classification-Based Approaches, Data Mining Applications.

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. AmiteshSinha(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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

IMAGE PROCESSING AND PATTERN RECOGNIZATION

(Interdepartmental Elective-II)

Course Code: A2616

L	T	P	C
4	-	-	4

Course Overview:

Visual information plays an important role in almost all areas of our life. Today, much of this information is represented and processed digitally. Digital image processing is ubiquitous, with applications ranging from television to tomography, from photography to printing, from robotics to remote sensing.

Prerequisite(s):

- Mathematics – I
- Computer Graphics

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Know and understand the basics and fundamentals of digital signal and image processing, such as digitization, sampling, quantization, and 2D-transforms.

CO2. Operate on images using the processing techniques of smoothing, sharpening, enhancing, reconstructing geometrical alterations, filtering, restoration, segmentation, features extraction, compression, encoding and color /multichannel.

CO3. Manipulate images using the computer: reading, writing, printing, and operating on them.

CO4. Apply and relate the basic imaging techniques to practical cases, such as, multimedia, videoconferencing, pattern and object recognition.

CO5. Aware of the ethical and legal issues related to image processing, such as, copyright, security, privacy, pornography, electronic distribution, etc**.**

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

IMAGE PROCESSING AND PATTERN RECOGNIZATION

(Interdepartmental Elective - II)

Course Code: A2616

L	T	P	C
4	-	-	4

SYLLABUS

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, D C T .

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

POWER ELECTRONICS
(Interdepartmental Elective - II)

Course Code: A2220

L	T	P	C
4	-	-	4

Course Overview:

Course Overview: The course is an introduction to power electronic devices and provides a basic knowledge of circuitry for the control and conversion of electrical power with high efficiency. These elements can change and regulate the voltage, current, or power via dc-dc converters, ac-dc rectifiers, dc-ac inverters, and ac-ac cycloconverters. Also it carries the study of power semiconductor devices operation extends to high power applications by their switching and static characteristics. Applications include electronic power supplies, aerospace and vehicular power systems, and renewable energy systems.

Prerequisite(s): EDC, Network Analysis

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. By the end of the course, the student shall be able to confidently analyze and build simple Power Electronic circuits

CO2. Students can categorize the various power electronic devices and power converters.

CO3. Development of basic skills in design and analysis of basic phase controlled converters, DC-DC converters (CHOPPERS), AC-AC converters, DC-AC converters and control strategies.

CO4. Students are able to Compute input power factor, total harmonic distortion of various input and output waveforms of various converters.

CO5. Students can categorize the various applications of power electronic devices and power converters.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

POWER ELECTRONICS

(Interdepartmental Elective - II)

Course Code: A2220

L	T	P	C
4	-	-	4

SYLLABUS

UNIT – I **(14 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 **(15 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 **(14 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

VLSI DESIGN

(Interdepartmental Elective - II)

Course Code: A2426

L	T	P	C
4	-	-	4

Course Overview:

This course gives knowledge about the design, analysis, simulation of circuits used as building blocks in Very Large Scale Integration (VLSI) devices. It gives knowledge about different processes used for fabrication of an IC. It explains the characteristics of MOS transistor and its device equations. It gives detailed study on design rules, stick diagrams, logic gates, types of delays, fan-in, fan-out which effects the action of a MOS. The course also focuses on CMOS testing principles and testing methods used for system level and chip level.

Prerequisite(s):

- Electronic devices
- Digital Logic Design
- Digital Design Through Verilog HDL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Employ mathematical methods and circuit analysis models in the analysis of CMOS digital electronics circuits.
CO2. Convey the knowledge of advanced concepts of circuit design for digital VLSI components in state of the MOS technologies.
CO3. Create models of moderately sized CMOS circuits that realize specified digital functions.
CO4. Complete a significant VLSI design project having a set of objective criteria and design constraints and optimize a CMOS layer
CO5. Predict the concept of design flow in back end and front end design including simulation, synthesis and design verification.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

VLSI DESIGN

(Interdepartmental Elective - II)

Course Code: A2426

L	T	P	C
4	-	-	4

SYLLABUS

UNCSE - 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.

UNCSE - II **(10 Lectures)**

CMOS PROCESSING TECHNOLOGY: Overview-Wafer Processing, Oxidation, EpCSEaxy, deposCSEion, ion-implantation and diffusion, the silicon gate process, Basic CMOS technology, Latchup – Origin of Latch up, Latch up triggering, Latch-up prevention.

UNCSE - III **(14Lectures)**

MOS-CIRCUCSE 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. **CIRCUCSE CHARACTERIZATION:** Introduction, Resistance Estimation, CapacCSEance Estimation, Inductance, SwCSEching Characteristics-analytic delays models, Power Dissipation, Scaling of MOS Transistor Dimensions.

UNCSE - IV **(12 Lectures)**

CMOS CIRCUCSE 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.

UNCSE - V **(14 Lectures)**

CMOS TESTING: Need for Testing, Manufacturing Test Principles-fault models, ObservabilCSEy, ControllabilCSEy, 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 EdCSEion, Pearson Education Asia, India.
2. Kamran Eshraghian, Dougles A. Pucknell, SholehEshraghian (2005), Essentials of VLSI CircuCSEs and Systems, PHI, New Delhi.

REFERENCE BOOKS:

1. John .P. Uyemura (2011), Introduction to VLSI CircuCSEs and Systems, John Wiley, India.
   S.M. Sze (2003), VLSI Technology, 2nd EdCSEion, Tata McGraw Hill, New Delhi.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

ROBOTICS
(Interdepartmental Elective - II)

Course Code: A2351

L	T	P	C
4	-	-	4

Course Overview:

Course Covers fundamentals of robot working, programming and integration in a manufacturing process. It starts with examples of robotics idea over history and continue with a numerous of examples in nowadays robot applications on different areas of human activities. Topics to be covered include robot mechanical, power, measuring and control system, robot kinematics, dynamic, control and programming. Special chapter of mobile robots will cover mobile robot kinematics, path planning and control. Overview of nowadays research in robotics and view of the robotics impact in human future.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Importance of robotics in today and future goods production.
CO2. Robot configuration and subsystems
CO3. Principles of robot programming and handle with typical robot
CO4. Working of mobile robots

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

ROBOTICS

(Interdepartmental Elective - II)

Course Code: A2351

L	T	P	C
4	-	-	4

SYLLABUS

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., New Delhi.
2. P. Coiffet, M. Chaironze (2010), *An Introduction to Robot Technology*, 3rd edition, Kogam Page Ltd., London.
3. Richard D. Klafter (2010), *Robotic Engineering*, 2nd edition, Prentice Hall of India, New Delhi.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

AIR POLLUTION AND CONTROL METHODOLOGIES
(Interdepartmental Elective - II)

Course Code: A2154

L	T	P	C
4	-	-	4

Course Overview:

Air pollution is defined as the presence in the outdoor atmosphere (ambient air) of one or more contaminants in such quantities and for such duration as to be harmful or injurious to human health or welfare, animal or plant life, or property, or may unreasonably interfere with the enjoyment of life or property. It is useful to study the causes and sources of the various air pollutants, as well as their physical and chemical characteristics and these are discussed. There are many different air pollutants, all with differing physical and chemical characteristics, as well as a vast number and variety of air pollution sources.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. **List** the main air pollutants and their effects on human health, welfare and the environment.

CO2. **Solv**e simple problems related to dispersion and air quality modeling.

CO3. **Choose** methods for control, and prevention of air pollution to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety.

CO4. **Distinguish** between various methods of air pollution analysis.

CO5. **Interpret** meteorological data for atmospheric stability and air pollutant transport and dispersion.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

AIR POLLUTION AND CONTROL METHODOLOGIES

(Interdepartmental Elective - II)

Course Code: A2154

L	T	P	C
4	-	-	4

SYLLABUS

UNIT-I **(12 Lectures)**

AIR POLLUTION: Definitions, 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 **(12 Lectures)**

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 **(12 Lectures)**

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 **(12 Lectures)**

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 **(12 Lectures)**

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

OPERATIONS RESEARCH
(Interdepartmental Elective - II)

Course Code: A2333

L	T	P	C
4	-	-	4

Course Overview:

The purpose of the course is to provide students with the concepts and tools to help them understand the operations research and mathematical modeling methods. These methods will help the students to solve economic issues, which help to make a decision. The main goal is to find the lowest cost or the greatest profit in many linear programming in the economic field issues. The model was used to resolve the issue of transport. There are many of the problems regarding the transfer of goods within a minimum of expenses or the distribution of goods to obtain the maximum profit. It was used as a matter of allocation of activating the role of the distribution functions optimally to get the desired goal as costs or profits.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Applying a different linear programming problem technique which has a broad experience in finding the optimum profit

CO2. Apply the knowledge of the course in solving real life problems

CO3. Calculate the knowledge that tries to optimize total return by maximizing the profit and minimizing the cost or loss

CO4. Recognize the best (optimum) decisions relative to largest possible portion of the total organization

CO5. Discuss towards the development of better working procedure and systematic approach in problem analysis, modeling and implementation of solutions at the workplace

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

OPERATIONS RESEARCH
(Interdepartmental Elective - II)

Course Code: A2333

L	T	P	C
4	-	-	4

SYLLABUS

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. S. Hillier, G. J. Lieberman (2007), *Introduction to Operations Research,* 8th edition, Tata McGraw Hill, New Delhi, India.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

COMPUTER GRAPHICS
(Professional Elective - I)

Course Code: A2614

L	T	P	C
3	1	-	4

Course Overview:

This course focuses on giving introduction about computer graphics and its wide range of application areas. It also gives information about the graphics hardware, working of hardware and software which are needed for producing graphics. This course gives information about basic algorithms for drawing basic shapes which includes lines, circles, ellipse, also for filling shapes with colors and applying 2D, 3D transformations on them. Different types of objects which are used for representing 2D-objects, 3D-objects in computer are mentioned here. Viewing mechanism of 2D-objects, 3D-objects is also taught and also focuses on Animation.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Identify computer graphics applications, computer graphics Hardware and software.
CO2. Extend basic geometric primitives algorithms for producing custom shapes and Compute 2D or 3D transformations for doing manipulations on objects.
CO3. Combine basic transformations to produce composite transformations and compare the 2D, 3D viewing process and can select the appropriate clipping techniques for producing view of objects.
CO4. Analyze the curve generation techniques and Illustrate 3D rendering process, various types of projection methods available.
CO5. Utilize the efficient visible surface detection algorithms, projection concepts in rendering a view of scene of objects.
CO6. Interpret and Create the animation sequences of motion by using animation techniques like key frame animations, Interpolation techniques etc.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

COMPUTER GRAPHICS
(Professional Elective - I)

Course Code: A2614

L	T	P	C
3	1	-	4

SYLLABUS

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.

Zhig and xiang, Roy Plastock (2000), Computer Graphics, 2 nd edition, Schaum's outlines, Tata Mc Graw Hill Edition, USA.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

BUILDING ENTERPRISE APPLICATIONS

(Professional Elective - I)

Course Code: A2615

L	T	P	C
3	1	-	4

Course Overview:

This course consists of the Java EE platform is designed to help developers create large-scale, multi-tiered, scalable, reliable, and secure network applications. A shorthand name for such applications is "enterprise applications," so called because these applications are designed to solve the problems encountered by large enterprises. Enterprise applications are not only useful for large corporations, agencies, and governments, however. The benefits of an enterprise application are helpful, even essential, for individual developers and small organizations in an increasingly networked world.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Dynamically generate content in various formats for the client.
CO2. Collect input from users of the client interface and return appropriate results from the components in the business tier.
CO3. Control the flow of screens or pages on the client.
CO4. Maintain the state of data for a user's session.
CO5. Perform some basic logic and hold some data temporarily in JavaBeans components.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

BUILDING ENTERPRISE APPLICATIONS
(Professional Elective - I)

Course Code: A2615

L	T	P	C
3	1	-	4

SYLLABUS

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)**

CONSRUCTING 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

NEURAL NETWORK
(Professional Elective - I)

Course Code: A2524

L	T	P	C
3	1	-	4

Course Overview:

This course aims at introducing the fundamental theory and concepts of computational intelligence methods, in particular neural networks, fuzzy systems, genetic algorithms and their applications in the area of machine intelligence.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. To understand the fundamental theory and concepts of neural networks, neuro-modeling, several neural network paradigms and its applications.

CO2. To understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic control and other machine intelligence applications of fuzzy logic.

CO3. To understand the basics of an evolutionary computing paradigm known as genetic algorithms and its Application to engineering optimization problems.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

NEURAL NETWORK
(Professional Elective - I)

Course Code: A2524

L	T	P	C
3	1	-	4

SYLLABUS

UNIT – I **(12 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 **(12 Lectures)**

FEEDFORWARD NEURAL NETWORKS: SUPERVISED LEARNING - I: Perceptrons - Learning and memory, Learning algorithms, Error correction and gradient decent rules, Perceptron learning algorithms.

SUPERVISED LEARNING - II: Backpropogation, Multilayered network architectures, Back propagation learning algorithm, Example applications of feed forward neural networks.

UNIT – III **(14 Lectures)**

FEDBACK 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 **(10 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 **(12 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 0074o 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

RATIONAL APPLICATION DEVELOPER

(Professional Elective - I)

Course Code: A2525

L	T	P	C
3	1	-	4

Course Overview:

Rational Application Developer is the re-branding of WebSphere Studio Application Developer. IBM built WebSphere Studio Application Developer on top of Eclipse -- an open source project to develop an open, extensible, integrated development environment (IDE) -- and customized it for J2EE development specifically for WebSphere. With the acquisition of the rational family of products, IBM has now extended WebSphere Studio Application Developer and the rational portfolio to include a fully integrated family of products, the IBM® Rational® Software Development Platform, that allow developers and project teams to collaborate on the entire project life cycle.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Understanding Web Application Server (WAS)

CO2. Develop and test servlets using Web Application Server

CO3. Develop and test JSP pages using Web Application Server

CO 4. Learn how to use JavaBeans, JSPs and servlets in accordance with the Model/View/Controller (MVC) programming model

CO5. Develop, test, and use JSP custom tags

CO6. Describe deployment and run-time issues of Java EE-based applications including security, scalability, and work load management in the context of Web Application Server

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

RATIONAL APPLICATION DEVELOPER

(Professional Elective - I)

Course Code: A2525

L	T	P	C
3	1	-	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

ADVANCED COMPUTER ARCHITECTURE

(Professional Elective - I)

Course Code: A2526

L	T	P	C
3	1	-	4

Course Overview:

This course is about the principles of computer design; instruction set design concepts, performance enhancements, new and alternative computer architectures, and the design and implementation of high performance computing systems. It equips you with the skills to undertake performance comparisons, improve the performance of applications, and develop applications to solve computationally intensive problems.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Describe the principles of computer design.
CO2. Classify instruction set architectures
CO3. Analyze the operation of performance enhancements such as pipelines, caches, shared memory.
CO4. Describe modern architectures such as RISC, VLIW (very large instruction word) and multi-cpu systems.
CO5. Compare the performance of different architectures

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

ADVANCED COMPUTER ARCHITECTURE

(Professional Elective - I)

Course Code: A2526

L	T	P	C
3	1	-	4

SYLLABUS

UNIT – I **(10 Lectures)**

Fundamentals of Computer design- Technology trends- cost- measuring and reporting performance quantitative principles of computer design.

UNIT – II **(12 Lectures)**

Instruction set principles and examples- classifying instruction set- memory addressing- type and size of operands- addressing modes for signal processing-operations in the instruction set- instructions for control flow- encoding an instruction set.-the role of compiler.

UNIT-III **(12 Lectures)**

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP. ILP software approach- compiler techniques- static branch protection – VLIW approach – Hardware support for exposing more parallelism at compile time, crosscutting issues.

UNIT – IV **(14 Lectures)**

Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of Virtual memory.

Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

UNIT-V **(12 Lectures)**

Storage systems- Types – Buses – RAID- errors and failures- bench marking a storage device- designing a I/O system.

Inter connection networks and clusters- interconnection network media – practical issues in interconnecting networks- examples – clusters- designing a cluster.

TEXT BOOK:

1. Computer Architecture A quantitative approach 3rd edition John L. Hennessy & David A. Patterson Morgan Kufmann (An Imprint of Elsevier)

REFERENCES:

1. “Computer Architecture and parallel Processing” Kai Hwang and A.Briggs International Edition McGraw-Hill.
2. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.
   Parallel Computer Architecture, A Hardware / Software Approach, David E. Culler, Jaswinder Pal singh with Anoop Gupta, Elsevier.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

DISTRIBUTED OPERATING SYSTEMS
(Professional Elective - I)

Course Code: A2527

L	T	P	C
3	1	-	4

Course Overview:

This Course examines fundamental principles of distributed systems. It discusses issues in distributed operating system with emphasis on communication, process naming synchronization consistence and replication.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Understand the difference between Operating System and distributed Operating System, and also understand the issues related to the design of distributed operating system.

CO2. Understand group communication in distributed system, understand and implement ATM networks, understanding the client server model and how to apply layered protocols to remote procedure calls

CO3. Understand Synchronization and deadlock in Distributed Operating System by learning various algorithms

CO4. Understand the issues of terms of scheduling for user level processes /threads

CO5. Design and resolve the issues related to distributed shared memory

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

DISTRIBUTED OPERATING SYSTEMS
(Professional Elective - I)

Course Code: A2527

L	T	P	C
3	1	-	4

SYLLABUS

UNIT –I **(12 Lectures)**

Introduction to Distributed Systems: What is a Distributed System? Goals, 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

CLOUD COMPUTING LAB

Course Code: A2618

L	T	P	C
-	-	3	2

Course Overview:

In this Course we will create virtual machine and run applications and perform various operations on each virtual machine like load balancing service providing.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Implement a data center with two hosts using Virtualbox.

CO2. Implement cloud Services using Windows Azure, Open stack, Owncloud.

CO3. Write case studies on real time implementation of AmazonEC2, AmazonS3 and windows Azure.

CO4. Evaluate various vendor offerings in this space.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

CLOUD COMPUTING LAB

Course Code: A2618

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS

EXPERIMENTS LIST:

i) Software Study – Hadoop
ii) Service Deployment & Usage over cloud
iii) Managing Cloud Computing Recourses
iv) Using cloud characteristics & Service models
v) 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.
vi) Performance evaluation of service over cloud.
vii) Create a "N "virtual machine in cloud environment.
viii) Case Study: Google App Engine , Microsoft Azure
ix) Case Study: Hadoop , Amazon, Aneka

TEXT BOOKS / REFERENCE BOOKS / MATERIALS:

1. Mastering Cloud Computing by Rajkumar Bunya, 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

DATA MINING AND DATA WAREHOUSING LAB

Course Code: A2528

L	T	P	C
-	-	3	2

Course Overview:

The course addresses the concepts, skills, methodologies, and models of data warehousing. The course addresses proper techniques for designing data warehouses for various business domains, and covers concepts for potential uses of the data warehouse and other data repositories in mining opportunities. Data mining, the extraction of hidden predictive information from large databases, is a powerful new technology with great potential to help companies focus on the most important information in their data warehouses. Data mining tools predict future trends and behaviors, allowing businesses to make proactive, knowledge-driven decisions.

Prerequisite(s): Database Management Systems

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Develop skills required to work with WEKA and KETTLE Pentaho tools

CO2. Develop various data transformations and flow controls using Kettle Pentaho tool.

CO3. Build data Cubes and perform OLAP Operations using Kettle Pentaho tool.

CO4. Apply various association rule mining and classification Techniques on given datasets and analyze their results.

CO5. Compare the clustering Techniques on given datasets and analyze their results.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VII Semester **VCE-R14**

DATA MINING AND DATA WAREHOUSING LAB

Course Code: A2528

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS

Week-1 (Introduction - Weka)

1. a) Installation and Introduction to Weka Tool

Week-2 (Preprocessing - Weka)

2. a) Preprocessing Data Using Weka Tool. File conversion from Excel to ARFF
   b) Opening File from Local file system.
   c) Opening File from website.

Week-3 (Integration - Kettle Pentaho)

3. a) Installation, Introduction to Kettle Pentaho data Integration Tool.
   b) Opening the Pentaho data Integration IDE and create a New repository.
   c) Connect to the Created Repository.
   d) create an ODBC CONNECTION.

Week-4 (Transformations - Kettle Pentaho)

4. Developing transformations Using Kettle Pentaho data Integration Tool.
   a) Transform CSV file input into XML file output
   b) Transform CSV file Input into excel file output.
   c) Transform Access to Excel.

Week-5 (Transformations - Kettle Pentaho)

5. Developing Flow control Transformation using kettle Pentaho
   a) Transform Access file/sql server file into excel file by control data flow.

Week-6 (Sql Server Analysis)

6. Sql server Analysis service for Data Analytics
   a) Create data source connection.
   b) Create data source view.
   c) Create OLAP Cube in SQL Server Analysis Server.

Week-7 (Sql Server Analysis)

7. Sql server Analysis service for Data Analytics
   a) Perform OLAP operations on DATACUBE.

Week -8 (Association Rule Mining)

8. Use Apriori - Trace the results of using the Apriori algorithm on the grocery store example with support threshold *s*=33.34% and confidence threshold *c*=60%. Show the candidate and frequent item-sets for each database scan. Enumerate all the final frequent item-sets. Also indicate the association rules that are generated and highlight the strong ones, sort them by confidence.

Transaction ID	Items
T1	HotDogs, Buns, Ketchup
T2	HotDogs, Buns
T3	HotDogs, Coke, Chips
T4	Chips, Coke
T5	Chips, Ketchup
T6	HotDogs, Coke, Chips

Week-9 (Association Rule Mining)

9. a) **FP-tree and FP-Growth**
   i) Use the transactional database from the previous exercise with same support threshold and build a frequent pattern tree (FP-Tree). Show for each transaction how the tree evolves.
   ii) Use Fp-Growth to discover the frequent item-sets from this FP-tree.

b) **Using WEKA,** Load a dataset described with nominal attributes, e.g. weather.nominal. Run the Apriori algorithm to generate association rules.

Week 10 (Classification)

10. a) Build Base line classification models using Zero R and One R
    b) Generate Decision Tree using J48, Use *credit .arff* database.

Week-11: (Clustering)

11. Being given the following relation: Student (Name, grade Math, grade Programming, grade Physics, grade English, grade Overall), create an .arff file containing at least 15 instances, load it into Weka, and apply k-Means clustering to it. Also cluster the instances without Weka, and compare the results. Pick different initial cluster centroids and compare the results.

REFERENCE BOOK(S):

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

SYLLABI FOR
VIII SEMESTER

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

PROFESSIONAL ETHICS & INTELLECTUAL PROPERTY RIGHTS

Course Code: A2015

L	T	P	C
3	1	0	4

Course Overview:

It is essential for professionals in any field to have an understanding of the ethical problems and principles in their field. But anyone, no matter what their job, must deal with many other professions as well. Part of professional ethics is the understanding of the ethics of other professions: how they interact and what can be expected from them as correct ethical behaviour. In turn, any professional will benefit from a critical scrutiny of their own ethics by those from other professions. The general principles of professional ethics will be examined, as well as the distinctive problems of the different fields. Intellectual property may be thought of as different forms of legal rights over creativity or innovation. Within Australia, the main forms of intellectual property protected, and the focus of this course, are statutory rights relating to Copyright, Patents, Designs and Trade Marks, as well as rights relating to confidentiality and unfair competition. Intellectual Property is also a global concern, with complex interrelationships between the different forms of Intellectual Property and the process of reform of those rights.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Students will learn senses in Engineering ethics, varieties of moral issues and human values using ethical theories.

CO2. Students will learn code of ethics, role of engineers as experimenters, law of ethics.

CO3. The students will be aware of responsibilities of an engineer for safety and risk benefit analysis.

CO4. Students will lean the importance of intellectual property rights, how to acquire trademarks and other parameters related to trademarks

CO5. Students will learn law of copy rights, law of patents and new development in intellectual property rights.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

PROFESSIONAL ETHICS & INTELLECTUAL PROPERTY RIGHTS

Course Code: A2015

L	T	P	C
3	1	0	4

SYLLABUS

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

SOFTWARE TESTING AND QUALITY ASSURANCE

(Professional Elective - II)

Course Code: A2613

L	T	P	C
3	1	-	4

Course Overview:

This course explores the goals of quality assurance and quality control activities performed during the life cycle of a software product. It focuses on integrating test processes with agile software development methodologies. Practical exercises give experience of design, specification, execution of tests plus test automation using tools through a mixture of instructor-directed exercises and student research leading to knowledge sharing.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Upon completion of this course, students will be able to: Understand various test processes and continuous quality improvement, types of errors and fault models.

CO2. Methods of test generation from requirements

CO3. Understand input space modelling using combinatorial designs, combinatorial test generation

CO4. Understand the test adequacy assessment using: control flow, dataflow, and program mutations commercial environments

CO5. Provides basic knowledge base to the software professionals, managers and architects willing to save time, effort and money by implementing a software discipline within their organizations.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

SOFTWARE TESTING AND QUALITY ASSURANCE
(Professional Elective - II)

Course Code: A2613

L	T	P	C
3	1	-	4

SYLLABUS

UNIT – I **(10 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 **(13 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 **(08 Lectures)**

STATES, STATE GRAPHS AND TRANSITION TESTING: State graphs, good state graphs and bad, state graphs, 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 **(10 Lectures)**

AN OVERVIEW OF SOFTWARE TESTING TOOLS: Provide tools (win Runner, QTP, Selenium, Bugzilla etc) in the lab, it is helpful to students to learn more about software testing and debugging

TEXT BOOKS:

1. Boris Beizer (2004), Software Testing Techniques, 2nd edition, Dreamtech Press, New Delhi, India.
2. Dr. K. V. K. K. Prasad (2005), Software Testing Tools, Dreamtech Press, 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

BIG DATA

(Professional Elective - II)

Course Code: A2621

L	T	P	C
3	1	-	4

Course Overview:

This course covers statistical analysis methods, soft computing frame works, design of distributed files systems besides covering visualization techniques and stream data models.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Apply the statistical analysis methods.

CO2. Compare and contrast various soft computing frameworks.

CO3. Design distributed file systems.

CO4. Apply Stream data model.

CO5. Use visualization techniques.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

BIG DATA

(Professional Elective - II)

Course Code: A2621

L	T	P	C
3	1	-	4

SYLLABUS

UNIT – I **(12 Lectures)**

INTRODUCTION TO BIG DATA: Introduction, Defining Big Data, Why Big Data and why now? Big Data examples. Working with Big Data: Introduction, Data explosion, Data volume, Data velocity. Big Data Processing Architectures: Data processing revisited, Data processing techniques, Data processing infrastructure challenges, Shared-everything and shared-nothing architectures, Big Data processing, Telco Big Data study.

INTRODUCING BIG DATA TECHNOLOGIES: Distributed data processing, Big Data processing requirements, Technologies for Big Data processing, Hadoop, NoSQL, Textual ETL processing, Case Studies-Sensor data, Streaming data.

UNIT – II **(12 Lectures)**

REENGINEERING THE DATA WAREHOUSE: Enterprise data warehouse platform, Choices for reengineering the data warehouse, modernizing the data warehouse, Case study of data warehouse modernization.

WORKLOAD MANAGEMENT IN THE DATA WAREHOUSE: Defining workloads, Query classification, ETL and CDC workloads, Current system design limitations, New workloads and Big Data. New Technologies Applied to Data Warehousing: Data warehouse challenges revisited, Data warehouse appliance, Data virtualization.

UNIT – III **(10 Lectures)**

INTEGRATION OF BIG DATA AND DATA WAREHOUSING: Components of the new data warehouse, Integration strategies, Hadoop & RDBMS, Big Data appliances, Data virtualization, Semantic framework.

DATA-DRIVEN ARCHITECTURE FOR BIG DATA: Metadata, Master data management, Processing data in the data warehouse, Processing complexity of Big Data, Machine learning, Information life-cycle management,Big Data Analytics, Data discovery, Visualization.

UNIT – IV **(10 Lectures)**

WRITING HADOOP MAPREDUCE PROGRAMS: Understanding the basics of MapReduce, Introducing Hadoop MapReduce, Understanding the Hadoop MapReduce fundamentals, Writing a Hadoop MapReduce example, Learning the different ways to write Hadoop MapReduce in R.

INTEGRATING R AND HADOOP: Introducing RHIPE, Understanding the architecture of RHIPE, Understanding RHIPE samples, Understanding the RHIPE function reference, Introducing RHadoop.

UNIT – V **(10 Lectures)**

USING HADOOP STREAMING WITH R: Understanding the basics of Hadoop streaming, Understanding how to run Hadoop streaming with R, Exploring the HadoopStreaming R package,Understanding the data analytics project life cycle.

BIG DATA ANALYSIS WITH MACHINE LEARNING: Introduction to machine learning, Supervised machine-learning algorithms, unsupervised machine learning algorithm.

TEXT BOOKS:

1. Krish Krishnan(2013), *Data Mining: Concepts and Techniques*, 3rd Edition, Morgan Kaufmann Elsevier, USA.

2. VigneshPrajapati (2013), *Big Data Analytics with R and Hadoop*, 1st Edition, Packt Publishing Ltd, UK.

REFERENCE BOOKS:

1. Jules J. Berman (2013), *Principles of Big Data Preparing, Sharing, and Analyzing Complex Information*, 1st Edition, Morgan Kaufmann Elsevier, USA.
2. David Loshin (2013),*Big Data Analytics - From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph*, 1st Edition, Morgan Kaufmann Elsevier, USA.**SYLLABUS**

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

GRID COMPUTING

(Professional Elective - II)

Course Code: A2530

L	T	P	C
3	1	-	4

Course Overview:

This course is designed to give a broad overview of the concept of grid computing and state-of-the-art grid software, understanding and practical experience of how computational grids can be used to further research in science and technology, and to review some current and future directions of grid computing research and development.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1: Understand the fundamental principles of distributed computing.
CO2: Understand how the distributed computing environments known as Grids can be built from lower level services.
CO3: Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing.
CO4: Analyze the performance of Cloud Computing.
CO5: Understand the concept of Cloud Security.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

GRID COMPUTING
(Professional Elective - II)

Course Code: 2530

L	T	P	C
3	1	-	4

SYLLABUS

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 Security - 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 BOOK:

1. Maozhen Li, Mark Baker, The Grid Core Technologies, John Wiley & Sons, 2005. REFERENCES:
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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

NATURAL LANGUAGE PROCESSING
(Professional Elective - II)

Course Code: A2531

L	T	P	C
3	1	-	4

Course Overview:

This course presents an introduction to the computational modelling of natural language. Topics covered include: computational morphology, language modelling, syntactic parsing, lexical and compositional semantics, and discourse analysis. We will consider selected applications such as automatic summarization, machine translation, and speech processing. We will also study machine learning algorithms that are used in natural language processing.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. The students will get acquainted with natural language processing and learn how to apply basic algorithms in this field.

CO2. They will understand the algorithmic description of the main language levels: morphology, syntax, semantics, and pragmatics, as well as the resources of natural language data - corpora.

CO3. They will also grasp basics of knowledge representation, inference, and relations to the artificial intelligence.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

NATURAL LANGUAGE PROCESSING
(Professional Elective - II)

Course Code: A2531

L	T	P	C
3	1	-	4

SYLLABUS

UNIT-I **(12 Lectures)**

INTRODUCTION TO NATURAL LANGUAGE UNDERSTANDING: The study of Language, Applications of NLP, Evaluating Language Understanding Systems, Different levels of Language Analysis, Representations and Understanding, Organization of Natural language Understanding Systems, Linguistic Background: An outline of English syntax.

UNIT-II **(10 Lectures)**

SEMANTICS AND LOGICAL FORM: Semantics and logic form, word sense and ambiguity, the basic logical form language, encoding ambiguity in the logical form, verbs and states in logical form, thematic roles, speech acts and embedded sentences and defining semantics structure model theory.

UNIT-III **(12 Lectures)**

GRAMMARS AND PARSING: Grammars and sentence Structure, Top-Down and Bottom-Up Parsers, Transition Network Grammars, Top- Down Chart Parsing. Feature Systems and Augmented Grammars: Basic Feature system for English, Morphological Analysis and the Lexicon, Parsing with Features, Augmented Transition Networks.

UNIT-IV **(10 Lectures)**

GRAMMARS FOR NATURAL LANGUAGE: Auxiliary Verbs and Verb Phrases, Movement Phenomenon Handling questions in Context-Free Grammars. Human preferences in Parsing, Encoding uncertainty, Deterministic Parser.

UNIT-V **(12 Lectures)**

AMBIGUITY RESOLUTION: Statistical Methods, Probabilistic Language Processing, Estimating Probabilities, Part-of- Speech tagging, Obtaining Lexical Probabilities, Probabilistic Context-Free Grammars, Best First Parsing. Semantics and Logical Form, Word senses and Ambiguity, Encoding Ambiguity in Logical Form.

TEXT BOOKS:

1. James Allen, Natural Language Understanding, Pearson Education

REFERENCE BOOKS:

1. Akshar Bharti, Vineet Chaitanya and Rajeev Sangal, NLP: A Paninian Perspective, Prentice Hall, New Delhi.
2. D. Jurafsky, J. H. Martin, Speech and Language Processing, Pearson Education.
3. L.M. Ivansca, S. C. Shapiro, Natural Language Processing and Language Representation.
4. T. Winograd, Language as a Cognitive Process, Addison-Wesley .

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSEVI/VII/VIII Semester **VCE-R14**

DISTRIBUTED DATABASES
(Professional Elective - II)

Course Code: A2532

L	T	P	C
3	1	-	4

Course Overview:

A Database is a collection of data describing the activities of one or more related organizations with a specific well defined structure and purpose. A Database is controlled by Database Management System (DBMS) by maintaining and utilizing large collections of data. A Distributed System is the one in which hardware and software components at networked computers communicate and coordinate their activity only by passing messages. In short a Distributed database is a collection of databases that can be stored at different computer network sites. It also provides various aspects like replication, fragmentation and various problems that can be faced in distributed database systems.

Prerequisite(s): Database Management Systems.

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Apply Top-Down Design Process, Distributed Database Design Issues, Fragmentation, Allocation, and Database Integration-Bottom-up approach.

CO2. Analysis of Query Decomposition Normalization, Primary Horizontal, Vertical, derived and Hybrid Fragmentation.

CO3. Examine of Query optimization, Concurrency Control and Deadlock Management.

CO4. Use Query Parallelism, Parallel Query Optimization and Load Balancing.

CO5. Interpret Distributed Object Storage, Object Query Processing and Transaction Management.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

DISTRIBUTED DATABASES
(Professional Elective - II)

Course Code: A2532

L	T	P	C
3	1	-	4

SYLLABUS

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, Compluexity 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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

MULTICORE ARCHITECTURE AND PROGRAMMING

(Professional Elective - II)

Course Code: A2533

L	T	P	C
3	1	-	4

Course Overview:

The course addresses issues related to heterogeneous multi-core architectures that are in all computing varying from mobile phones, commodity desktops to large computing clusters. The students will use and program three different architectures, and have to learn how to handle different types of asymmetric cores, interconnects and memory. During the course, the students will understand the challenges in writing efficient programs for the different architectures.

Lab-assignments are an important part of the course. The students program the SIMD units found in modern processors, graphics processing units (GPUs) from Nvidia and machines connected with PCI Express interconnect from Dolphin Interconnect Solutions.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Understand how a typical multimedia workload such as a video encoder is built up.

CO2. Use profiling to identify and fix bottlenecks in programs.

CO3. Use the SIMD units found on almost all modern processors.

CO4. Program Nvidia GPUs using the CUDA framework.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

MULTICORE ARCHITECTURE AND PROGRAMMING

(Professional Elective - II)

Course Code: A2533

L	T	P	C
3	1	-	4

SYLLABUS

UNIT - I **(14 Lectures)**

Introduction to Multi-core Architecture Motivation for Concurrency in software, Parallel Computing Platforms, Parallel Computing in Microprocessors, Differentiating Multi-core Architectures from Hyper-Threading Technology, Multithreading on Single-Core versus Multi-Core Platforms Understanding Performance, Amdahl's Law, Growing Returns: Gustafson's Law.

System Overview of Threading Defining Threads, System View of Threads, Threading above the Operating System, Threads inside the OS, Threads inside the Hardware, What Happens When a Thread Is Created, Application

UNIT - II **(13 Lectures)**

Programming Models and Threading, Virtual Environment: VMs and Platforms, Runtime Virtualization, System Virtualization. Fundamental Concepts of Parallel Programming Designing for Threads, Task Decomposition, Data Decomposition, Data Flow Decomposition, Implications of Different Decompositions, Challenges You'll Face, Parallel Programming Patterns, A Motivating Problem: Error Diffusion, Analysis of the Error Diffusion Algorithm, An Alternate Approach: Parallel Error Diffusion, Other Alternatives.

UNIT - III **(12 Lectures)**

Threading and Parallel Programming Constructs Synchronization, Critical Sections, Deadlock, Synchronization Primitives, Semaphores, Locks, Condition Variables, Messages, Flow Control- based Concepts, Fence, Barrier, Implementation dependent Threading Features. Threading APIs Threading APIs for Microsoft Windows, Win32/MFC Thread APIs, Threading APIs for Microsoft. NET Framework, Creating Threads, Managing Threads, Thread Pools, Thread Synchronization, POSIX Threads, Creating Threads, Managing Threads, Thread Synchronization, Signalling, Compilation and Linking.

UNIT - IV **(12 Lectures)**

OpenMP: A Portable Solution for Threading Challenges in Threading a Loop, Loop-carried Dependence, Data-race Conditions, Managing Shared and Private Data, Loop Scheduling and Portioning, Effective Use of Reductions, Minimizing Threading Overhead, Work-sharing Sections, Performance-oriented Programming, Using Barrier and No wait, Interleaving Single-thread and Multi-thread Execution, Data Copy-in and Copy-out, Protecting Updates of Shared Variables, Intel Task queuing Extension to OpenMP, OpenMP Library Functions, OpenMP Environment Variables, Compilation, Debugging, performance.

UNIT - V **(12 Lectures)**

Solutions to Common Parallel Programming Problems Too Many Threads, Data Races, Deadlocks, and Live Locks, Deadlock, Heavily Contended Locks, Priority Inversion, Solutions for Heavily Contended Locks, Non-blocking Algorithms, ABA Problem, Cache Line Ping-ponging, Memory Reclamation Problem, Recommendations, Thread- safe Functions and Libraries, Memory Issues, Bandwidth, Working in the Cache, Memory Contention, Cache- related Issues, False Sharing, Memory Consistency, Current IA-32 Architecture, Itanium Architecture, High-level Languages, Avoiding Pipeline Stalls on IA-32,Data Organization for High Performance.

TEXT BOOK:

1. Multicore Programming , Increased Performance through Software Multi-threading by Shameem Akhter and Jason Roberts , Intel Press , 2006

REFERENCE READING:

1. MPI: www-unix.mcs.anl.gov/mpi/

2. OpenMP: www.openmp.org/
3. Single core optimization: spiral.ece.cmu.edu:8080/pub-spiral/pubfile/paper_100.pdf

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

INFORMATION RETRIEVAL SYSTEMS

(Professional Elective - III)

Course Code: A2626

L	T	P	C
3	1	-	4

Course Overview:

These course fundamentals of information retrieval systems focus on indexing searching, classification, storage, browsing, and also on computer algorithms and methods using in this field.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Implements algorithms like clustering, pattern searching, stemming algorithms and etc.

CO2. Understand the internal architecture of search engine.

CO3. Generate classification among the web pages using clustering techniques.

CO4. Help the student to understand the challenges over information retrieval systems by exploring functional difficulties over multimedia search and based rapid growing web content.

CO5. Design new algorithms based on existing challenges over web search and can able to develop modern digital libraries.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

INFORMATION RETRIEVAL SYSTEMS

(Professional Elective - III)

Course Code: A2626

L	T	P	C
3	1	-	4

SYLLABUS

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. Frakes W. B, Ricardo Baeza Yates (1992), Information Retrieval Data Structures and Algorithms ,Pearson Education / Prentice Hall of India, New Delhi, India.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

SEMANTIC WEB AND SOCIAL NETWORKS

(Professional Elective - III)

Course Code: A2627

L	T	P	C
3	1	-	4

Course Overview:

Semantic Web and Social Networks combines the concepts and the methods of two fields of investigation, which together have the power to aid in the analysis of the social Web and the design of a new class of applications that combine human intelligence with machine processing. Social Network Analysis and the emerging Semantic Web are also the fields that stand to gain most from the new Web in achieving their full potential. On the one hand, the social Web delivers social network data at an extraordinary scale, with a dynamics and precision that has been outside of reach for more traditional methods of observing social structure and behavior. In realizing this potential, the technology of the Semantic Web provides the key in aggregating information across heterogeneous sources. The Semantic Web itself benefits by incorporating user-generated metadata and other clues left behind by users.

Prerequisite(s): Basics of Web Technologies, Computer Networks

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Able to understand the basics of Intelligent Web Applications and limitations.

CO2. Able to be proficient with Ontology's and their role in the semantic web and Ontology Languages like Resource Description Framework, RDF schema, Ontology Web Language (OWL)XML schema.

CO3. Able to understand and design current Semantic Web Applications, Services and Technologies to meet desired needs within realistic constraints.

CO4. Able to analyze and identify web searching problems and apply the semantic searching techniques and applications for obtaining its solution.

CO5. Demonstrate knowledge of professional, ethical, legal, security and social issues and responsibilities in designing Semantic web and social Networks.

CO6. To understand and analyze social networks and design solutions for web based social networks like Blogs and Online Communities and their impact on the individuals, organizations, and society.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

SEMANTIC WEB AND SOCIAL NETWORKS

(Professional Elective - III)

Course Code: A2627

L	T	P	C
3	1	-	4

SYLLABUS

UNIT - I **(8 Lectures)**

WEB INTELLIGENCE: Thinking and Intelligent Web Applications, The Information Age, The World WideWeb, 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. H. Peter Alesso, Craig F. Smith (2009), *Thinking on the Web: Berners Lee, Godel, Turing*, John Wiley and Sons, New Jersey.
2. Peter Mika (2007), Social Networks and the Semantic Web, 1st Edition, Springer, USA.

REFERENCE BOOKS:

1. J. Davies, Rudi Studer, Paul Warren (2006), *Semantic Web Technologies, Trends and Research in Ontology Based Systems*, 1st Edition, John Wiley & Sons, England.
2. Liyang Yu (2007), *Introduction to the Semantic Web and Semantic Web Services*, 1st Edition, Chapman & Hall/CRC, USA.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

GAME DEVELOPMENT USING CUDA
(Professional Elective - III)

Course Code: A2628

L	T	P	C
3	1	-	4

Course Overview:

Modern game engines have a lot going on. With so many different subsystems competing for resources, multi-threading is a way of life. As multi-core CPUs have gotten cheaper and cheaper, game developers have been able to more easily take advantage of parallelism. While Intel and AMD fight to bring more cores and more cores to the CPU, GPUs have been easily surpassing them for raw parallel abilities. Modern GPUs contain thousands of cores, allowing tens of thousands of threads to execute code simultaneously. This presents game developers with yet another opportunity to add parallelism to their programs.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Analyze applications that benefit from massive amounts of parallelism.
CO2. Become familiar with contemporary parallel programming paradigms and the systems on which they are used
CO3. Gain significant experience with GPU computing hardware and programming models, with specific emphasis on NVIDIA's CUDA architecture.
CO4. Analyze and measure performance of modern parallel computing systems.
CO5. Analyze the impact of communication latency and resource contention on throughput.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

GAME DEVELOPMENT USING CUDA
(Professional Elective - III)

Course Code: A2628

L	T	P	C
3	1	-	4

SYLLABUS

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 b 10 Ck Id X and th read 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.

REFERENCES:

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.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

FAULT TOLERANCE COMPUTING
(Professional Elective - III)

Course Code: A2534

L	T	P	C
3	1	-	4

Course Overview:

Fault tolerance is the ability of a system to continue performing its intended function despite of faults. In a broad sense, fault tolerance is associated with reliability, with successful operation, and with the absence of breakdowns. The ultimate goal of fault tolerance is the development of a dependable system. As computer systems become relied upon by society more and more, dependability of these systems becomes a critical issue. In airplanes, chemical plants, heart pace-makers or other safety critical applications, a system failure can cost people's lives or environmental disaster.

Prerequisite(s):

- Electronic Devices and Circuits
- Digital Logic Design
- VLSI Design

Course Outcomes:

Upon successful completion of this course, student will be able to:

Upon successful completion of this course, the students will be able to:

CO1. Convey relation between reliability and meantime between failures, maintainability and availability.

CO2. Categorize basic techniques for achieving fault-tolerance in electronic, communication and software systems and skills in modeling and evaluating fault-tolerant architectures in terms of reliability, availability and safety.

CO3. Deduct knowledge in sources of faults and means for their prevention and forecasting, transition count testing, and signature analysis.

CO4. Inference merits and limitations of fault-tolerant design, random access scan technique, built-in test, designs for autonomous self-test.

CO5. Convey the knowledge of savings in test-engineering time may be offset by added design engineering effort to include Design of Fault Tolerance.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

FAULT TOLERANCE COMPUTING
(Professional Elective - III)

Course Code: A2534

L	T	P	C
3	1	-	4

SYLLABUS

UNIT –I **(12 Lectures)**

Basic concepts of reliability - definition, failure rate, relation between reliability and mean time between failures, Faults in Digital Circuits – failures and faults, modelling of faults, temporary faults, Test Generation – fault diagnosis of digital systems, test generation for combinational logic circuits and sequential logic circuits, detection of multiple faults in combinational logic circuits

UNIT –II **(08 Lectures)**

Introduction to Fault Tolerant Design of Digital Systems: Fault Tolerance, Static redundancy, Dynamic redundancy, Fault tolerant design of Memory systems using error correcting codes, Practical Fault Tolerant Systems: FTMP, ESS, COMTRAC

UNIT –III **(09 Lectures)**

Self checking and fail safe logic: Introduction, design of totally self checking checkers, self checking sequential machines, partially self checking circuits, strongly fault secure circuits

UNIT –IV **(10 Lectures)**

Fail - Safe Design, Totally self checking PLA design, Design for Testability: Testability, Controllability and Observability, Design of testable Combinational Logic Circuits

UNIT –V **(13 Lectures)**

Testable design of Sequential Circuits, The scan path technique for testable sequential circuit design, LSSD, Random Access Scan Technique, Built- In Test, design for autonomous Self-test, Designing testability into logic boards.

TEXT BOOKS:

1. Fault Tolerant and Fault Testable Hardware Design, Parag K. Lala, PHI, 1985

REFERENCE BOOKS:

1. Fault Tolerant Computing Theory and Techniques-Volume I, D.K. Pradhan, PHI, 1986.
2. Testing of Digital Systems, Nirajjha and Sandeep Gupta, Cambridge University Press, 2003.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSEVI/VII/VIII Semester **VCE-R14**

SOFTWARE ARCHITECTURE
(Professional Elective - III)

Course Code: A2535

L	T	P	C
3	1	-	4

Course Overview:

This course deals with the concepts of architecture of software. The list of topics to study in this course are Introduction to the fundamentals of software architecture, Software architecture and quality requirements of a software system, Fundamental principles and guidelines for software architecture design, architectural styles, patterns, and frameworks, Methods, techniques, and tools for describing software architecture and documenting design rationale, Software architecture design and evaluation processes, Rationale and architectural knowledge management in software architecting, Approaches and tools for designing and evaluating software architectures for the state-of- the-art technologies such as cloud-computing, service-orientation, and mobile computing, Future challenges and emerging trends in software architecture discipline

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Demonstrate the importance and role of software architecture in large-scale software systems.

CO2. Design and Integrate software architecture for large-scale software systems.

CO3. Recognize major software architectural styles, design patterns, and frameworks.

CO4. Generate architectural alternatives for a problem and selection among them.

CO5. Identify and assess the quality attributes of a system at the architectural level.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

SOFTWARE ARCHITECTURE
(Professional Elective - III)

Course Code: A2535

L	T	P	C
3	1	-	4

SYLLABUS

UNIT-I **(06 Lectures)**

INTRODUCTION TO SOFTWARE ARCHITECTURE

Introduction to Software Architecture, status of Software Architecture, architecture Business Cycle, software Architectures Evolution. Software Processes and the architecture business cycle, features of good architecture.

ARCHITECTURE STYLES

Pipes and filters, data abstraction and object oriented organization, even-based implicit invocation, layered systems, registers, interpreters, process Control, other Familiar architectures, heterogeneous architectures.

UNIT-II **(07 Lectures)**

SHARED INFORMATION SYSTEMS

Database integration, interpretation in software development environments, architectural structures for shared Information Systems.

ARCHITECTURAL DESIGN GUIDANCE

Guidance for user interface architectures, case study in inter-operability: World Wide Web.

UNIT-III **(05 Lectures)**

PATTERN TYPES

Architectural patterns, structural patterns, patterns for distribution, patterns for interactive systems.

FORMAL MODELS AND SPECIFICATIONS

Finalizing the architectural of a specific system, architectural styles, architectural design space, case Study: CORBA.

UNIT-IV **(07 Lectures)**

LINGUISTIC ISSUES

Requirements for Architectural-Description Languages, first-class connectors, adding implicit invocation to traditional programming languages.

TOOLS FOR ARCHITECTURAL DESIGN

Unicon: A Universal Connector Language, exploiting style in architectural design environments, beyond definition use: architectural interconnection

UNIT-V **(09 Lectures)**

CREATING AN ARCHITECTURE

Understanding quality attributes, achieving qualities, air traffic control, documenting software architectures.

TEXT BOOKS:

1. Len Bass, Paul Elements, Rick Kazman(1998), Software Architecture in Practice, PEA
2. Mary Show, David Garlan(1996), Software Architecture. Perspective: on an Emerging Discipline, PHI.

REFERENCE BOOKS:

1. Garmus, Herros(1996), Measuring the Software Process: A Practical Guide to Functional Measure, PHI.
2. Florac, Carleton(1999), Meas. Software Process: Stat. Proce. Cont. for Software process Improvements, PEA.
3. W.Humphery(2002), Introduction to Team Software Process, PEA.
4. Peters, Yourdon(1981), Software Design: Methods and Techniques.
5. Buschmann, Wiley(1996), Pattern Oriented Software Architecture.
6. Gamma et al(1995), Design Patterns, PEA.
7. Gamma, Shaw(1995), An Introduction to Software Architecture, World Scientific.
8. Shaw, Gamma(1996), Software Architecture, PHI.

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VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

SOFT COMPUTING
(Professional Elective - III)

Course Code: A2536

L	T	P	C
3	1	-	4

Course Overview:

Introduction to Soft Computing, Fuzzy Sets Theory, Fuzzy Logic, Artificial Neural Networks, Probabilistic Reasoning, Genetic Algorithms, Neuro-Fuzzy Technology, Combination of Genetic Algorithms with Neural Networks, Combination of Genetic Algorithms and Fuzzy Logic, Applications of Soft Computing (three to four real life applications).

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory.
CO2. Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic
CO3. To understand the fundamental theory and concepts of neural networks, Identify different neural network architectures, algorithms, applications and their limitations
CO4. Understand appropriate learning rules for each of the architectures and learn several neural network paradigms and its applications
CO 5. Reveal different applications of these models to solve engineering and other problems.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

SOFT COMPUTING

(Professional Elective - III)

Course Code: A2536

L	T	P	C
3	1	-	4

SYLLABUS

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 propogation, 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.

4. Synthesis and Applications, Prentice Hall of India, New Delhi, India.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

INDUSTRY ORIENTED DESIGN LAB

Course Code: A2537

L	T	P	C
-	-	6	2

Course Overview:

This course consists of the design of a problem-based learning approach that seeks to embed industrial knowledge in the enterprise resource planning (ERP)-related curriculum of universities. It describes a project that is developing a business reference model for public administration. This reference model is to be implemented in the leading ERP system SAP R/3. Teaching cases are developed through collaboration between universities and industry. The paper argues that this approach is in alignment with the recommendations of key curriculum documents and educational approaches.

Prerequisite(s): NIL

Course Outcomes:

Upon successful completion of this course, student will be able to:

CO1. To create GUI (front end) for hospital and alumni for students
CO2. To able to create website for fast food centres (Pizza hut ect..)
CO3. To able to create website for Furniture shop and hotel accommodations
CO4. To able to create website for Computer sales and services shop
CO5. To able to create website for Job Search

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

B. Tech. CSE VIII Semester **VCE-R14**

INDUSTRY ORIENTED DESIGN LAB

Course Code: A2537

L	T	P	C
-	-	6	2

EXPERIMENTS

Using any open source graphical user interface design software, design Home page for the following applications adopting GUI design principles.

1. A Mutli 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

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 to be University and an Autonomy College?**
   A Deemed to be University is fully autonomous to the extent of awarding its own Degree. A Deemed to be 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 performance, 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 an eye on the academics and keep its reports and recommendations every year. In addition to the 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 students with their final grades 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?

Students shall be permitted for re-evaluation after the declaration of end semester examination results within a stipulated period by paying prescribed fee. But there will not be any re-examination system.

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 grades will reflect the average performance of all the semesters put together in CGPA format.

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 internal and external examinations. All matters involving the conduct of examinations, spot valuations, tabulations, preparation of Grade Sheet 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 and posted 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
(AUTONOMOUS)

Undertaking by Students/Parents

"To make the students **attend** the classes regularly from the first day of starting of classes and be aware ofthe **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. ---------- joining I Semester / III Semester for theacademic year 2015-2016/ 2016-2017 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/JNTUH. 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 on 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 is not permissible and involving in Ragging is an **offence** and punishable as per JNTUH/UGC rules and the law.
7. I will **pay** tuition fees, examination fees and any other **dues** within the stipulated time as required by the Institution/ 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 myself continuously for 3 days**, my **parents** will have to meet the HODconcerned/ Principal.
10. I hereby **acknowledge** that I have **received** acopy of **R15 Academic Rules and Regulations, Syllabus copy** and hence, I shall **abide** by all the rules specified in it.

ACKNOWLEDGEMENT

I have carefully gone through the terms of the undertaking mentioned above and I 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, shall be liable for suitable action as per College/JNTUH rules and the law. I undertake that I/he/she will strictly follow the above terms.

Signature of Student

Signature of Parent
Name & Address with Phone Number

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

Undertaking by Students/Parents

"To make the students **attend** the classes regularly from the first day of starting of classes and be aware ofthe **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. ---------- joining I Semester / III Semester for theacademic year 2015-2016/ 2016-2017 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/JNTUH. 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 on 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 is not permissible and involving in Ragging is an **offence** and punishable as per JNTUH/UGC rules and the law.
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ACKNOWLEDGEMENT

I have carefully gone through the terms of the undertaking mentioned above and I 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, shall be liable for suitable action as per College/JNTUH rules and the law. I undertake that I/he/she will strictly follow the above terms.

Signature of Student

Signature of Parent

Name & Address with Phone Number

-- OFFICE COPY --