



VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

(Permanently Affiliated to JNTUH, Approved by AICTE, New Delhi and Accredited by NBA)
Shamshabad – 501 218, Hyderabad

MASTER OF TECHNOLOGY

SOFTWARE ENGINEERING

**ACADEMIC REGULATIONS, COURSE STRUCTURE AND SYLLABI FOR
M.TECH - SOFTWARE ENGINEERING UNDER AUTONOMOUS STATUS
FOR THE BATCHES ADMITTED FROM THE ACADEMIC YEAR 2011 - 12**

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

PRELIMINARY DEFINITIONS AND NOMENCLATURES

- “Autonomous Institute / College” means an institute / college designated as autonomous institute / college by the Jawaharlal Nehru Technological University, Hyderabad (JNTUH), as per the JNTUH Autonomous College Statutes, 2011.
- “Academic Autonomy” means freedom to a College in all aspects of conducting its academic programs, granted by the University for promoting excellence.
- “Commission” means University Grants Commission.
- “AICTE” means All India Council for Technical Education.
- “University” the Jawaharlal Nehru Technological University, Hyderabad.
- “College” means Vardhaman College of Engineering, Hyderabad unless indicated otherwise by the context.
- “Program” means:
 - Bachelor of Technology (B.Tech) degree program
 - UG Degree Program: B.Tech
 - PG degree Program: M.Tech
- “Branch” means specialization in a program like M.Tech degree program in Power Electronics and Electrical Drives.
- “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, ABS11T01: Mathematics - I, ACS11T02: Data Structures through C, etc.
- T – Tutorial, P – Practical, D – Drawing, L - Theory, C - Credits

FOREWORD

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

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

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

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications 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

(Autonomous)

(Permanent Affiliation with JNTUH, Approved by AICTE, New Delhi and Accredited by NBA)

ACADEMIC REGULATIONS

M.Tech. Regular Two Year Post-Graduate Programme

(For the batches admitted from the academic year 2011-12)

For pursuing Two year degree program of study in Master of Technology (M.Tech.) offered by Vardhaman College of Engineering under Autonomous status and herein after referred to as VCE:

1. APPLICABILITY

All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2011-2012 onwards. Any reference to "College" in these rules and regulations stands for Vardhaman College of Engineering.

2. EXTENT

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

3. PROGRAMS OFFERED

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

S. No	M.Tech Courses	Intake
1	Computer Science and Engineering	36
2	Software Engineering	18
3	Digital Electronics and Communication Systems	36
4	Wireless and Mobile Communications	18
5	Power Electronics and Electrical Drives	18

4. ADMISSION

Admission into first year of Two Year M.Tech Program shall be made subject to the eligibility, qualifications and specialization as per the guidelines prescribed by the APSCHE and AICTE from time to time.

5. DURATION OF THE PROGRAMS

5.1 Normal Duration

M.Tech degree program extends over a period of two academic years leading to the Degree of Master of Technology (M.Tech) of the Jawaharlal Nehru Technology University, Hyderabad.

5.2 Maximum Duration

- 5.2.1 The maximum period within which a student must complete a full-time academic program is 4 years for M.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.
- 5.2.3 The period is reckoned from the academic year in which the student is admitted first time into the degree programme.

6. 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. 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 90 working days. The academic calendar is shown in Table 1 is declared at the start of the semester. The duration for each semester shall be a minimum of 17 weeks of instruction.

Table 1: Academic Calendar

FIRST SEMESTER (23 weeks)	I Spell Instruction Period : 9 weeks	19 weeks
	I Mid Examinations : 1 week	
	II Spell Instruction Period : 8 weeks	
	II Mid Examinations : 1 Week	
	Preparation & Practical Examinations	2 weeks
	External Examinations	2 weeks
Semester Break		2 weeks
SECOND SEMESTER (23 weeks)	I Spell Instruction Period : 9 weeks	19 weeks
	I Mid Examinations : 1 week	
	II Spell Instruction Period : 8 weeks	
	II Mid Examinations : 1 Week	
	Preparation & Practical Examinations	2 weeks
	External Examinations	2 weeks
Summer Vacation		4 weeks
THIRD SEMESTER	Project Work Phase – I	18 Weeks
FOURTH SEMESTER	Project Work Phase – II	18 Weeks

7. CREDIT BASED SYSTEM

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

- 7.1. The duration of each semester will normally be 23 weeks with 5 days a week. A working day shall have 6 periods each of 60 minutes duration.
- 1 credit per lecture period per week
 - 2 credits for three (or more) period hours of practicals
 - 2 credits for technical seminar
 - 4 credits for comprehensive viva examination
 - 18 credits for project work phase – I
 - 22 credits for project work phase – II

- 7.2. The two year curriculum of any M.Tech programme of study shall have total of 88 credits. The exact requirements of credits for each course will be as recommended by the Board of Studies concerned and approved by the Academic Council.
- 7.3. For courses like technical seminar / comprehensive viva / Project Work Phases – I and II, where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

8. 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 100 marks for practical, on the basis of Internal Evaluation and End Semester Examination.

8.1 Theory

For all lecture based theory courses, the evaluation shall be for 40 marks through internal evaluation and 60 marks through external end semester examination of three hours duration.

8.1.1. Internal evaluation

For theory subjects, during the semester there shall be 2 midterm examinations. Each midterm examination consists of subjective test. The subjective test is for 40 marks, with duration of 2 hours. The Mid-Term Examination question paper shall be set with **six** questions out of which **four** are to be answered. All questions carry equal marks.

First midterm examination shall be conducted for I – IV units of syllabus and second midterm examination shall be conducted for the remaining portion.

The internal marks shall be computed as the average of the two internal evaluations, of two subjective tests.

8.1.2. External Evaluation

The question paper shall be set externally and valued both internally and externally. The external end semester examination question paper in theory subjects will be for a maximum of 60 marks to be answered in three hours duration. For End-Semester examination, the candidate has to answer any five out of eight questions. Each question carries 12 marks. Each theory course shall consist of eight units of syllabus.

8.2. Practicals

Practicals shall be evaluated for 100 marks, out of which 60 marks are for external examination and 40 marks are for internal evaluation. The 40 internal marks are distributed as 25 marks for day-to-day work and 15 marks for internal examination. The external end - examination shall be conducted by the teacher concerned and an external examiner from outside the college.

8.3. 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 50% of maximum marks shall be obtained to earn the corresponding credits.

8.4. **Comprehensive Viva**

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

8.5. **Project Work**

The project work shall be evaluated for 200 marks out of which 50 marks for phase – I internal evaluation, 50 marks for phase – II internal evaluation and 100 marks for end semester evaluation. A minimum of 50% of marks on the aggregate in the internal evaluation and external end-evaluation taken together shall be obtained to earn the corresponding credits.

Every candidate is required to submit dissertation after taking up a topic approved by the Departmental Committee. The project work shall be spread over in III semester and in IV semester. The project work shall be somewhat innovative in nature, exploring the research bent of mind of the student.

The Departmental Committee (DC) consists of HOD, Supervisor and two senior experts in the department. The committee monitors the progress of Project Work. The DC is constituted by the Principal on the recommendations of the department Head.

Student shall register for the Project work with the approval of Departmental Committee in the III Semester and continue the work in the IV Semester too. The Departmental Committee (DC) shall monitor the progress of the project work. In III Semester, Phase – I of the Project Work is to be completed. A Student has to identify the topic of work, collect relevant Literature, preliminary data, implementation tools / methodologies etc., and perform a critical study and analysis of the problem identified. He shall submit status report in two different phases in addition to oral presentation before the Departmental Committee for evaluation and award of 50 internal marks at the end of Phase – I.

A candidate shall continue the Project Work in IV Semester (Phase – II) and submit a Project report at the end of Phase – II after approval of the Departmental Committee. During Phase – II, the student shall submit status report in two different phases, in addition to oral presentation before the DC. The DC shall evaluate the project for 50 internal marks based on the progress, presentations and quality of work.

A candidate shall be allowed to submit the dissertation only after passing all the courses of I and II semesters with the approval of Departmental Committee not earlier than **40 weeks** from the date of registration of the project work and then take viva-voce examination. The viva-voce examination may be conducted once in three months for all the eligible candidates.

Three copies of the dissertation certified in the prescribed form by the supervisor and HOD shall be presented to the Department and one copy is to be submitted to the Controller of Examinations, VCE and one copy to be sent to the examiner.

The department shall submit a panel of three experts for a maximum of 5 students at a time. However, the examiners for conducting viva-voce examination shall be nominated by the Controller of Examinations, VCE. If the report of the examiner is favorable, viva-voce examination shall be conducted by a board consisting of the Supervisor, Head of the Department and the examiner who adjudicated the dissertation. The board shall jointly evaluate the project work for 100 marks. The candidates who fail in viva-voce examinations shall have to re-appear the viva-voce examination after three months. If he fails again in the second viva-voce examination, the candidate has to re-register for the Project Work.

If a candidate desires to change the topic of the project already chosen during Phase – I, he has to re-register for Project work with the approval of the DC and repeat Phases – I and II. Marks already earned in Phase – I stand cancelled.

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

- 9.1. A student shall be eligible to appear for semester-end examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.
- 9.2. 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.
- 9.3. Shortage of attendance below 65% in aggregate shall in no case be condoned.
- 9.4. Students whose shortage of attendance is not condoned in any semester are not eligible to take their semester-end examination of that class and their registration shall stand cancelled.
- 9.5. 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.
- 9.6. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.
- 9.7. 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 AP norms in vogue.

10. ACADEMIC REQUIREMENTS FOR PROMOTION / COMPLETION OF REGULAR M.TECH PROGRAMME OF STUDY

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

- i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, and practical, if he secures not less than 40% of marks in the semester-end examination and a minimum of 50% of marks in the sum of the internal evaluation and semester - end examination taken together.
- ii. In case of 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 50% 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 50% of marks on the aggregate in the internal evaluation and external end-evaluation taken together.
- iv. A student shall register for all the 88 credits and earn all the 88 credits. Marks obtained in all the 88 credits shall be considered for the award of the class based on aggregate of marks.
- v. A student who fails to earn 88 credits as indicated in the course structure within **FOUR** academic years from the year of their admission shall forfeit their seat in M.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.

11. EVALUATION

Following procedure governs the evaluation.

- 11.1. 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.
- 11.2. 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.
- 11.3. Student-wise tabulation is done and student-wise memorandum of marks is generated which is issued to the student.

12. SUPPLEMENTARY EXAMINATION

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

13. RE-REGISTRATION FOR IMPROVEMENT OF INTERNAL

Following are the conditions to avail the benefit of improvement of internal marks.

- 13.1. The candidate should have completed the course work and obtained examinations results for I & II semesters.
- 13.2. A candidate shall be given one chance for a maximum of Three Theory subjects for Improvement of Internal evaluation marks for which the candidate has to re-register for the chosen subjects and fulfill the academic requirements.
- 13.3. For each subject, the candidate has to pay a fee equivalent to one third of the semester tuition fee and the amount is to be remitted in the form of D.D. in favour of the Principal, Vardhaman College of Engineering payable at Hyderabad along with the requisition through the concerned Head of the Department.
- 13.4. In the event of availing the Improvement of Internal evaluation marks, the internal evaluation marks as well as the End Examinations marks secured in the previous attempt(s) for the re-registered subjects stand cancelled.

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. TRANSITORY REGULATIONS

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

16. 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.

17. AWARD OF DEGREE

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

17.1. Eligibility

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

- i. Registered and successfully completed all the components prescribed in the programme of study to which he is admitted.
- ii. Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.
- iii. Obtained not less than 50% of marks (minimum requirement for declaring as passed).
- iv. Has no dues to the college, hostel, and library etc. and to any other amenities provided by the College.
- v. No disciplinary action is pending against him.

17.2. Award of Class

Declaration of Class is based on percentage of marks to be secured.

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

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

Class Awarded	% of marks to be secured	
First Class with Distinction	70% and above	From the aggregate marks secured for the 88 Credits.
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Fail	Below 50%	

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

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

Grade Point	Percentage of Marks / Class
5.75	50 (Second Class)
6.25	55
6.75	60 (<i>First Class</i>)
7.25	65
7.75	70 (<i>First Class with Distinction</i>)
8.25	75

18. REGISTRATION

Each student has to compulsorily register for course work at the beginning of each semester as per the schedule mentioned in the Academic Calendar. It is absolutely compulsory for the student to register for courses in time.

19. TERMINATION FROM THE PROGRAM

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

- i. The student fails to satisfy the requirements of the program within the maximum period stipulated for that program.
- ii. The student fails to satisfy the norms of discipline specified by the institute from time to time.

20. CURRICULUM

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

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

21. WITH-HOLDING OF RESULTS

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

22. GRIEVANCES REDRESSAL COMMITTEE

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

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

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

23. MALPRACTICE PREVENTION COMMITTEE

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

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

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

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

24. 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.

25. STUDENTS' FEEDBACK

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

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

26. GRADUATION DAY

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

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

27. AWARD OF A RANK UNDER AUTONOMOUS SCHEME

27.1. One (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., 2 years for M.Tech.

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

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

28. CONDUCT AND DISCIPLINE

- 28.1 Each student shall conduct himself / herself in a manner befitting his / her association with VCE.
- 28.2 He / she is expected not to indulge in any activity, which is likely to bring disrepute to the college.
- 28.3 He / she should show due respect and courtesy to the teachers, administrators, officers and employees of the college and maintain cordial relationships with fellow students.
- 28.4 Lack of courtesy and decorum unbecoming of a student (both inside and outside the college), wilful damage or removal of Institute's property or belongings of fellow students, disturbing others in their studies, adoption of unfair means during examinations, breach of rules and regulations of the Institute, noisy and unruly behaviour and similar other undesirable activities shall constitute violation of code of conduct for the student.
- 28.5 **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.**
- 28.6 Violation of code of conduct shall invite disciplinary action which may include punishment such as reprimand, disciplinary probation, debarring from the examination, withdrawal of placement services, withholding of grades / degrees, cancellation of registration, etc., and even expulsion from the college.
- 28.7 Principal, based on the reports of the warden of Institute hostel, can reprimand, impose fine or take any other suitable measures against an inmate who violates either the code of conduct or rules and regulations pertaining to college hostel.
- 28.8 A student may be denied the award of degree / certificate even though he / she have satisfactorily completed all the academic requirements if the student is found guilty of offences warranting such an action.
- 28.9 Attendance is not given to the student during the suspension period.

29. OTHER ISSUES

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

- i. Selective admission of students to a programme, so that merit and aptitude for the chosen technical branch or specialization are given due consideration.
- ii. Faculty recruitment and orientation, so that qualified teachers trained in good teaching methods, technical leadership and students' motivation are available.
- iii. Instructional/Laboratory facilities and related physical infrastructure, so that they are adequate and are at the contemporary level.
- iv. 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:

- i. 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.

- ii. Life-long learning opportunities for faculty, students and alumni, to facilitate their dynamic interaction with the society, industries and the world of work.
- iii. Generous use of ICT and other modern technologies in everyday activities.

30. 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.

VARDHAMAN COLLEGE OF ENGINEERING (Autonomous)

SYLLABUS M. TECH - SOFTWARE ENGINEERING

REGULATIONS: VCE--R11

I SEMESTER							
Code	Subject	Periods per Week		Credits	Scheme of Examination Maximum Marks		
		L	P		Internal	External	Total
B1201	Data Structures and Algorithms	3	-	3	40	60	100
B1215	Object Oriented Analysis and Design	3	-	3	40	60	100
B1501	Software Requirements and Estimation	3	-	3	40	60	100
B1502	Software Process and Project Management	3	-	3	40	60	100
PROFESSIONAL ELECTIVE – I		3	-	3	40	60	100
PROFESSIONAL ELECTIVE – II		3	-	3	40	60	100
B1211	Data Structures and Algorithms Lab	-	3	2	40	60	100
B1504	Technical Seminar	-	-	2	50	-	50
TOTAL		18	03	22	330	420	750
II SEMESTER							
Code	Subject	Periods per week		Credits	Scheme of Examination Maximum Marks		
		L	P		Internal	External	Total
B1218	Data Warehousing and Data Mining	3	-	3	40	60	100
B1505	Software Quality Assurance and Testing	3	-	3	40	60	100
B1506	Service Oriented Architecture	3	-	3	40	60	100
B1507	Software Architecture and Design patterns	3	-	3	40	60	100
PROFESSIONAL ELECTIVE - III		3	-	3	40	60	100
PROFESSIONAL ELECTIVE - IV		3	-	3	40	60	100
B1511	Software Testing and Case Tools Lab	-	3	2	40	60	100
B1512	Technical Seminar	-	-	2	50	-	50
TOTAL		18	03	22	330	420	750
III SEMESTER							
Code	Subject	Periods per week		Credits	Scheme of Examination Maximum Marks		
		L	P		Internal	External	Total
B1513	Comprehensive Viva	-	-	4	-	50	50
B1514	Project Work Phase – I	-	-	18	50	-	50
TOTAL		-	-	22	50	50	100
IV SEMESTER							
Code	Subject	Periods per week		Credits	Scheme of Examination Maximum Marks		
		L	P		Internal	External	Total
B1515	Project Work Phase – II	-	-	22	50	100	150
TOTAL		-	-	22	50	100	150

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SYLLABUS
M. TECH - SOFTWARE ENGINEERING

REGULATIONS: VCE--R11

ELECTIVES			
PROFESSIONAL ELECTIVE - I		PROFESSIONAL ELECTIVE – II	
Code	Subject	Code	Subject
B1205	Artificial Intelligence and Neural Networks	B1208	Web Technologies
B1207	Digital Image Processing and Pattern Recognition	B1209	Embedded Systems
B1503	Wireless Networks and Mobile Computing	B1210	C# and .Net Framework
PROFESSIONAL ELECTIVE – III		PROFESSIONAL ELECTIVE – IV	
Code	Subject	Code	Subject
B1217	Cloud Computing	B1219	Modern Compilers – Theory and Practice
B1508	Multimedia and Rich Internet Development	B1220	Distributed Computing
B1509	Network Security and Cryptography	B1510	Semantic Web and Social Networking

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I SEMESTER

DATA STRUCTURES AND ALGORITHMS

Course Code: B1201

L	P	C
3	-	3

UNIT - I

OVERVIEW OF DATA STRUCTURES: Review of arrays, stacks, queues, linked lists, linked stacks and linked queues, applications.

UNIT - II

ALGORITHM ANALYSIS: Efficiency of algorithms, apriori analysis, asymptotic notations, time complexity of an algorithm using o notation, polynomial vs. exponential algorithms, average, best and worst case complexities, analyzing recursive programs.

UNIT - III

TREES AND GRAPHS: Introduction, definition and basic terminologies of trees and binary trees, representation of trees and binary trees, binary tree traversals, threaded binary trees; Graphs basic concepts, representation and traversals.

UNIT - IV

BINARY SEARCH TREES, AVL TREES AND B -TREES: Introduction, binary search trees: definition, operations and applications. AVL trees: definition, operations and applications. B- trees: definition, operations and applications.

UNIT - V

RED BLACK TREES, SPLAY TREES AND HASH TABLES: Red black trees, splay trees and its applications. Hash tables: introduction to hash tables, hash functions and its applications.

UNIT - VI

DIVIDE AND CONQUER & GREEDY METHOD: General method, binary search, finding maximum and minimum, quick sort, merge sort, strassen's matrix multiplication. Greedy method, general method, minimum cost spanning trees, single source shortest path.

UNIT - VII

DYNAMIC PROGRAMMING: General method, all pairs shortest path, single source shortest path, 0/1 knapsack problem, reliability design, traveling sales person's problem.

UNIT - VIII

BACK TRACKING & BRANCH AND BOUND: General method, 8 queen's problem, graph coloring. Branch and bound, the general method, LC search, control abstraction, bounding 0 / 1 knapsack problem.

TEXT BOOKS:

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran (2008), *Fundamentals of Computer Algorithms*, 2nd edition, University Press (India) Private Limited, India.
2. G. A. V. Pai (2009), *Data Structures and Algorithms*, Tata Mcgraw hill, New Delhi.

REFERENCE BOOKS:

1. D. Samanta (2003), *Classic Data Structures*, Prentice Hall of India Private Limited.
2. Aho, Hopcraft, Ullman (1998), *Design and Analysis of Computer Algorithms*, Pearson Education India.
3. Goodman, Hedetniemi (2002), *Introduction to the Design and Analysis of Algorithms*, Tata Mcgraw Hill, New Delhi, India.
4. Adam Drozdek (2005), *Data Structures and Algorithms in C++*, 3rd Edition, Thomson Course Technology.

VARDHAMAN COLLEGE OF ENGINEERING

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II SEMESTER

OBJECT ORIENTED ANALYSIS AND DESIGN

Course Code: B1215

L	P	C
3	-	3

UNIT - I

OBJECT ORIENTED CONCEPTS: The meaning of object orientation, object identity, encapsulation, information hiding, polymorphism.

INTRODUCTION TO UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, architecture.

UNIT - II

BASIC STRUCTURAL MODELING: Classes, relationships, common mechanisms, diagrams.

CLASS AND OBJECT DIAGRAMS: Terms, concepts, modeling techniques for class and object diagrams.

UNIT - III

INTERACTION DIAGRAMS:

SEQUENCE DIAGRAMS: Terms, concepts, depicting asynchronous messages with/without priority, call back mechanism, broadcast messages, common modeling techniques.

COLLABORATION DIAGRAMS: Terms, concepts, depicting a message, polymorphism in collaboration diagram, iterated messages, use of self messages, common modeling techniques.

UNIT - IV

BASIC BEHAVIORAL MODELING: Use cases, use case diagrams, activity diagrams.

ADVANCED BEHAVIORAL MODELING: Events and signals, state machines, processes and threads, time and space, state chart diagrams.

UNIT - V

ARCHITECTURAL MODELING: Component, deployment, component diagrams and deployment diagrams.

UNIT - VI

THE UNIFIED PROCESS: Use case driven, architecture centric, iterative and incremental.

THE FOUR Ps: People, project, product and process.

USE CASE DRIVEN PROCESS: Why use case, capturing use cases, analysis, design and implementation to realize the use cases, testing the use cases.

ARCHITECTURE CENTRIC PROCESS: Architecture in brief, why we need architecture, use cases and architecture, the steps to architecture, an architecture description.

ITERATIVE INCREMENTAL PROCESS: Iterative incremental in brief, why iterative incremental development? The iterative approach is risk driven, the generic iteration.

UNIT -VII

INCEPTION PHASE: Early in the inception phase, the archetypal inception iteration workflow, execute the core workflows, requirements to test.

ELABORATION PHASE: Elaboration phase in brief, early in the elaboration phase, the architectural elaboration iteration workflow, execute the core workflows, requirements to test.

UNIT - VIII

CONSTRUCTION PHASE: Early in the construction phase, the archetypal construction iteration workflow, execute the core workflow.

TRANSITION PHASE: Early in the transition phase, activities in transition phase.

CASE STUDIES: Automation of a library, software simulator application (2-floor elevator simulator).

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson (2005), *The Unified Modeling Language User Guide*, 2nd edition, Pearson Education.
2. Ivar Jacobson, Grady Booch, James Rumbaugh (2009), *The Unified Software Development Process*, 5th edition, Pearson Education, India.

REFERENCE BOOKS:

1. Hans Erik Eriksson, Magnus Penker, Brian Lyons (2009), *UML 2 Toolkit*, WILEY Dreamtech India Private Limited, New Delhi, India.
2. Meilir Page Jones (2000), *Fundamentals of Object Oriented Design in UML*, Pearson Education, India.
3. Atul Kahate (2007), *Object Oriented Analysis and Design*, Tata McGraw-Hill, New Delhi, India.
4. Mark Priestley (2005), *Practical Object-Oriented Design with UML*, 2nd edition, Tata McGraw Hill, New Delhi, India.

VARDHAMAN COLLEGE OF ENGINEERING

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I SEMESTER

SOFTWARE REQUIREMENTS AND ESTIMATION

Course Code: B1501

L	P	C
3	-	3

UNIT - I

SOFTWARE REQUIREMENTS: WHAT AND WHY: Essential software requirement, good practices for requirements engineering, improving requirements processes, and software requirements and risk management.

UNIT - II

SOFTWARE REQUIREMENTS ENGINEERING : Requirements elicitation, requirements analysis documentation, review, elicitation techniques, analysis models, software quality attributes, risk reduction through prototyping, setting requirements priorities, and verifying requirements quality.

UNIT - III

SOFTWARE REQUIREMENTS MODELING: Use case modeling, analysis models, dataflow diagram, state transition diagram, class diagrams, object analysis, and problem frames.

UNIT - IV

SOFTWARE REQUIREMENTS MANAGEMENT: Requirements management principles and practices, requirements attributes, change management process, requirements traceability matrix, and links in requirements chain.

UNIT - V

REQUIREMENTS MANAGEMENT TOOLS: Benefits of using a requirements management tool, commercial requirements management tool, rational requisite pro, caliber RM and implementing requirements management automation.

UNIT - VI

SOFTWARE ESTIMATION: Components of software estimations, estimation methods, problems associated with estimation, and key project factors that influence estimation.

UNIT - VII

SIZE ESTIMATION: Two views of sizing, function point analysis, mark II FPA, full function points, LOC estimation and conversion between size measures.

UNIT - VIII

EFFORT, SCHEDULE AND COST ESTIMATION: What is productivity? Estimation factors, approaches to effort and schedule estimation, COCOMO II, Putnam estimation model, algorithmic models, and cost estimation.

SOFTWARE ESTIMATION TOOLS: Desirable features in software estimation tools, IFPUG, USC's COCOMO II, SLIM (software life cycle management) tools.

TEXT BOOKS:

1. Rajesh Naik, Swapna Kishore (2001), *Software Requirements and Estimation*, 1st Edition, Tata Mc Graw Hill, New Delhi, India.

REFERENCE BOOKS:

1. Karl E. Weigers (2003), *Software Requirements*, 2nd Edition, Microsoft Press, India.
2. Dean Leffingwell, Don Widrig (2003), *Managing Software Requirements: A Use Case Approach*, 2nd Edition, Pearson Education, India.
3. Suzanne Robertson, James Robertson (2006), *Mastering the requirements process*, 2nd Edition, Pearson Education, India.
4. Capers Jones (2007), *Estimating Software Costs*, 2nd Edition, Tata Mcgrawhill, India.
5. M.A. Parthasarathy (2007), *Practical Software Estimation*, Pearson Education, India.

VARDHAMAN COLLEGE OF ENGINEERING

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I SEMESTER

SOFTWARE PROCESS AND PROJECT MANAGEMENT

Course Code: B1502

L	P	C
3	-	3

UNIT - I

SOFTWARE PROCESS MATURITY: Software maturity framework, principles of software process change, software process assessment, the initial process, the repeatable process, the defined process, the managed process, the optimizing process.

UNIT - II

PROCESS REFERENCE MODELS: Capability maturity model (CMM), CMMi, PCMM, PSP, TSP.

UNIT – III

SOFTWARE PROJECT MANAGEMENT RENAISSANCE : Conventional software management, evolution of software economics, improving software economics, the old way and the new way.

UNIT – IV

LIFE CYCLE PHASES: Engineering and production stages, inception phase, elaboration phase, construction phase, transition phase.

SOFTWARE PROCESS ARTIFACTS: Artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model based software architectures.

UNIT – V

WORKFLOWS OF THE PROCESS: Software process workflows, Iteration workflows

CHECKPOINTS OF PROCESS: Major milestones, minor milestones, periodic status assessments.

UNIT – VI

PROCESS PLANNING AND PROJECT ORGANIZATIONS: Breakdown structures, planning guidelines, cost and schedule estimating process, iteration planning process, pragmatic planning, line of business organizations, project organizations, evolution of organizations, process automation.

UNIT – VII

PROJECT CONTROL AND PROCESS INSTRUMENTATION: The seven core metrics, management indicators, quality indicators, life-cycle expectations, pragmatic software metrics, and metrics automation.

UNIT – VIII

CCPDS-R CASE STUDY AND FUTURE SOFTWARE PROJECT MANAGEMENT PRACTICES: Modern project profiles, next-generation software economics, and modern process transitions.

TEXT BOOKS:

1. Watts S. Humphrey (2004), *Managing the Software Process*, 4th Edition, Pearson Education, USA.
2. Walker Royce (1998), *Software Project Management: A unified Framework*, 1st Edition, Addison Wesley, USA.

REFERENCE BOOKS:

1. Watts S. Humphrey (2008), *Introduction to the Team Software Process*, 3rd Edition, Pearson Education, India.
2. Watts S. Humphrey (1997), *Introduction to the personal Software Process*, Addison Wesley longman, USA.
3. James R. Persse (2006), *Process Improvement essentials*, 1st Edition, O'Reilly, USA.
4. Bill Curtis, William E. hefley and Sally A. Miller (2009), *The people capability maturity model*, 3rd Edition, Pearson Education, India.
5. Cranige Mellon, Mark C. Paulk, Charles C. Weber, Bill Curtis(2004), *The capability Maturity Model*, 2nd Edition, Addison Wesley, USA.

VARDHAMAN COLLEGE OF ENGINEERING

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I SEMESTER

ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS (Professional Elective - I)

Course Code: B1205

L	P	C
3	-	3

UNIT - I

INTRODUCTION TO ARTIFICIAL INTELLIGENCE: Problem and search, what is AI technique, criteria for success; problems, problem space and search, defining the problem as a state space search, production systems, problem characteristics, production system characteristics.

HEURISTIC SEARCH TECHNIQUES: Knowledge representation, knowledge representation issues, using predicate logic, resolution principle. Representing knowledge using rules, forward vs backward reasoning, symbolic reasoning under uncertainty, non monotonic reasoning, statistical reasoning.

UNIT - II

DIFFERENT KNOWLEDGE REPRESENTATION SCHEMES: Semantic nets, Marvin minsky's frames, conceptual dependency theory, scripts. Understanding, what is understanding, what makes understanding hard, understanding as constraint satisfaction, waltz's algorithm.

UNIT - III

NATURAL LANGUAGE PROCESSING: Overview of linguistics, grammars and languages, basic parsing techniques, transitional networks, semantic analysis and representation structures. Natural language generation, natural language systems, general concepts in knowledge acquisition. Types of learning, general learning model, performance measures, early work in machine learning, perceptrons, genetic algorithms, intelligent editors.

UNIT - IV

EXPERT SYSTEM ARCHITECTURE: Characteristic features of expert systems, history, applications. Rule based system architecture, expert system shells. Pattern recognition, the recognition and classification process, learning classification patterns, recognizing and understanding speech. Perception and action, features of AI programming language PROLOG.

UNIT - V

INTRODUCTION TO NEURAL NETWORKS: What is a neural network?, human brain, models of neuron, neural networks viewed as directed graphs, feedback, network architectures, knowledge representation, artificial intelligence and neural networks.

UNIT - VI

LEARNING PROCESSES: Introduction, error-correction learning, learning with a teacher, learning without a teacher, learning tasks, statistical nature of the learning process, statistical learning theory, probably approximately correct model of learning.

UNIT - VII

SINGLE LAYER PERCEPTRONS

Introduction, adaptive filtering problem, unconstrained optimization techniques, linear least-squares filters, least-mean square algorithm, learning curves, learning rate annealing techniques, perceptron, perceptron convergence theorem, relation between the perceptron and bayes classifier for a gaussian environment.

MULTILAYER PERCEPTRONS

Introduction, some preliminaries, back-propagation algorithm, summary of back-propagation algorithm, XOR problem.

UNIT - VIII

HEURISTICS: Heuristics for making the back propagation algorithm perform better, output representation and decision rule, computer experiment, feature detection, back-propagation and differentiation, hessian matrix, generalization, approximation of functions, cross validation, network pruning techniques, virtues and limitations of back-propagation learning, accelerated convergence of back propagation learning, supervised learning viewed as an optimization problem, convolution networks.

TEXT BOOKS:

1. Elaine Rich, Kevin Knight (2002), *Artificial Intelligence*, 2nd edition, Tata McGraw Hill, New Delhi.
2. Simon Haykin (1999), *Neural Networks: a Comprehensive Foundation*, 2nd edition, Pearson Education, India.

REFERENCE BOOKS:

1. Patrick Henry Winston (2001), *Artificial Intelligence*, 3rd edition, Pearson Education Private Limited, India.
2. Dan W. Patterson (1999), *Introduction to Artificial Intelligence and Expert Systems*, Prentice Hall of India.
3. Satish Kumar (2004), *Neural Networks: A classroom approach*, Tata McGraw Hill, New Delhi.
4. N. J Nilsson (2005), *Principles of Artificial Intelligence*, Morgan Kaufmann.
5. B. Yegnanarayana (2001), *Artificial Neural Networks*, Prentice Hall of India.

VARDHAMAN COLLEGE OF ENGINEERING
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I SEMESTER

DIGITAL IMAGE PROCESSING AND PATTERN RECOGNITION
(Professional Elective - I)

Course Code: **B1207**

L	P	C
3	-	3

UNIT - I

DIGITAL IMAGE FUNDAMENTALS: Introduction, digital image through scanner, digital camera, concept of gray levels gray level to binary image conversion, sampling and quantization, relation ship between pixels, imaging geometry.

UNIT - II

IMAGE TRANSFORMS: 2D FFT- properties, Walsh transform, hadamard transform, discrete cosine transform, haar transform, slant transform, hotelling transform.

UNIT - III

IMAGE ENHANCEMENT: Point processing, histogram processing, spatial filtering, enhancement in frequency domain, image smoothing, image sharpening.

UNIT - IV

IMAGE RESTORATION: Degradation model, algebraic approach to restoration, inverse filtering, least mean square filters, constrained least squares restoration, interactive restoration.

UNIT - V

IMAGE SEGMENTATION: Detection of discontinuities, edge linking and boundary detection, thresholding, region oriented segmentation.

UNIT - VI

IMAGE COMPRESSION: Redundancies and their removal methods, fidelity criteria, image compression models, source encoder and decoder, error free compression, lossy compression.

UNIT - VII

BASICS OF PATTERN RECOGNITION: Bayesian decision theory, classifiers, discriminant functions, decision surfaces, normal density and discriminant functions, discrete features.

UNIT - VIII

PARAMETER ESTIMATION METHODS: Maximum-likelihood estimation, gaussian mixture models, expectation-maximization method, bayesian estimation.

TEXT BOOKS:

1. R. C. Gonzalez, R. E. Woods (2002), *Digital Image processing*, 2nd edition, Addison Wesley, India.
2. S. Theodoridis, K. Koutroumbas (2009), *Pattern Recognition*, 4th edition, Academic Press.

REFERENCE BOOKS:

1. Anil K. Jain, Jain (1997), *Fundamentals of Digital Image processing*, Prentice Hall of India Private Limited.
2. Rafael C. Gonzalez, Richard E. Woods and Steven. L (2004), *Digital Image processing using MATLAB*, Pearson Education Asia.
3. William K. Pratt (2004), *Digital Image Processing*, 3rd edition, John Wiley, India.
4. R. O. Duda, P. E. Hart and D. G. Stork(2001), *Pattern Classification*, John Wiley, India.

VARDHAMAN COLLEGE OF ENGINEERING

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I SEMESTER

WIRELESS NETWORKS AND MOBILE COMPUTING (Professional Elective - I)

Course Code: B1503

L	P	C
3	-	3

UNIT - I

INTRODUCTION TO MOBILE AND WIRELESS LANDSCAPE: Definition of mobile and wireless, components of wireless environment, challenges overview of wireless networks, categories of wireless networks wireless LAN - infra red vs radio transmission, infrastructure and ad-hoc network, IEEE 802.11, HIPERLAN, Bluetooth.

UNIT - II

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS(GSM): GSM architecture, GSM entities, call routing in GSM, PLMN interfaces, GSM addresses and identifiers, network aspects in GSM, GSM frequency allocation, authentication and security.

UNIT - III

MOBILE NETWORK LAYER: Mobile IP (goals, assumptions, entities and terminology, ip packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), dynamic host configuration protocol (DHCP), mobile ad hoc networks, routing, destination sequence distance vector, dynamic source routing.

UNIT - IV

MOBILE TRANSPORT LAYER: Traditional TCP, indirect TCP, snooping TCP, mobile TCP, fast retransmit/fast recovery, transmission /time out freezing, selective retransmission, transaction oriented TCP.

UNIT - V

BROADCAST SYSTEMS: Overview, cyclical repetition of data, digital audio broadcasting: multimedia object transfer protocol, digital video broadcasting, DVB data broadcasting, DVB for high speed internet access, convergence of broadcasting and mobile communications.

UNIT - VI

PROTOCOLS AND TOOLS: Wireless application protocol WAP introduction, protocol architecture, and treatment of protocols of all layers, bluetooth user scenarios, physical layer, MAC layer, networking, security, link management and J2ME.

UNIT - VII

WIRELESS LANGUAGE AND CONTENT – GENERATION TECHNOLOGIES: Wireless content types, markup languages: HDML, WML, HTML, CHTML, XHTML, and VoiceXML. Content generation technologies: CGI with Perl, java servlets, java server pages, active server pages, xml with XSL stylesheets, XML document, XSL stylesheet

UNIT - VIII

MOBILE AND WIRELESS SECURITY: Creating a secure environment, security threats, security technologies, other security measures, WAP security, smart client security

TEXT BOOKS

1. Jochen Schiller (2008), *Mobile Communications*, 2nd Edition, Pearson Education, New Delhi, India.
2. Martyn Mallick (2008), *Mobile and Wireless Design Essentials*, Edition, Wiley, New York, USA.

REFERENCE BOOKS

1. Asoke K Talukder (2008), *Mobile Computing*, Tata McGraw Hill, New Delhi, India.
1. Raj Kamal (2007), *Mobile Computing*, 1st Edition, Oxford University Press.
2. William Stallings (2008), *Wireless Communications & Networks*, 2nd Edition Person Education, New Delhi, India.
3. Frank Adelstein (2005), *Fundamentals of Mobile and Pervasive Computing*, Tata McGraw Hill, New Delhi, India.
4. Sumit Kasera (2008), *2.5G Mobile Networks: GPRS and EDGE*, Tata McGraw Hill, New Delhi, India.

VARDHAMAN COLLEGE OF ENGINEERING

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I SEMESTER

WEB TECHNOLOGIES (Professional Elective - II)

Course Code: **B1208**

L	P	C
3	-	3

UNIT - I

INTRODUCTION TO HTML: Basic HTML, the document body, text, hyperlinks, lists, tables, images, frames, forms, Cascading Style Sheets: Introduction, simple examples, defining your own styles, properties and values in styles, formatting blocks of information, layers.

UNIT - II

JAVA SCRIPT: Basics, variables, string manipulation, arrays, functions, objects in java script, introduction to DHTML.

UNIT - III

EXTENSIBLE MARK-UP LANGUAGE (XML):

XML basics, document type definition, XML schema, presenting XML, introduction to DOM and SAX parsers.

UNIT - IV

DATABASE PROGRAMMING WITH JDBC: Database drivers, the java.sql package: connection management, database access, data types, database metadata, exceptions and warnings, loading a database driver and opening connections, establishing a connection, creating and executing SQL statements querying the database, prepared statements, mapping SQL types to java, transaction support, save points.

UNIT - V

SERVLET PROGRAMMING: Introduction, servlet implementation, servlet configuration, servlet exceptions, servlet lifecycle. Requests and responses: servletrequest, servletresponse, httpServletRequest, httpServletResponse interfaces, cookies, session creation and tracking using httpsession interface.

UNIT - VI

INTRODUCTION TO JSP: Introducing JSP, JSP directives, scripting elements, standard actions, implicit objects, scope and JSP pages as XML documents, introduction to MVC architecture.

UNIT - VII

JSP TAG EXTENSIONS: Introduction to javabeen, advantages of javabeen, introspection, getter and setter methods, introduction to JSP tag extensions, a simple tag, anatomy of a tag extension, writing tag extensions.

UNIT - VIII

JSP APPLICATIONS WITH TAG LIBRARIES: Benefits of using custom tag libraries, introducing the JSP standard tag library (JSPTL), getting started with the JSPTL, integrating the JSPTL into your JSP page, the JSPTL tags.

TEXT BOOKS:

1. Chris Bates (2007), *Web Programming Building Internet Applications*, 2nd edition, Wiley.
2. Subrahmanyam A, Cedric Buest (2004), *Professional Java Server Programming J2EE*, 1.3 Edition, SPD (apress).

REFERENCE BOOKS:

1. Dietel, Dietel (2009), *Internet and World Wide Web, How to program*, 4th edition, Pearson Education, India.
2. Watt, Jeff Rafter (2004), *Beginning XML*, Wiley Dreamtech, India.
3. J. McGovern, Rahim Adatia, Yakov Fain (2004), *J2EE 1.4 Bible*, Wiley Dreamtech, India.
4. Hans Bergsten (2004), *Java Server Pages*, 3rd edition, SPD O'Reilly, India.

VARDHAMAN COLLEGE OF ENGINEERING

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I SEMESTER

EMBEDDED SYSTEMS (Professional Elective - II)

Course Code: B1209

L	P	C
3	-	3

UNIT - I

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

UNIT - II

THE 8051 ARCHITECTURE: Introduction, 8051 micro controller hardware, input/output ports and circuits, external memory, counter and timers, serial data input/output, interrupts.

UNIT - III

BASIC ASSEMBLY LANGUAGE PROGRAMMING CONCEPTS: The assembly language programming process, programming tools and techniques, programming the 8051. Data transfer and logical instructions, arithmetic operations, decimal arithmetic, jump and call instructions, further details on interrupts.

UNIT - IV

APPLICATIONS: Interfacing with keyboards, displays, D/A and A/D conversions, multiple interrupts, serial data communication.

UNIT - V

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.

UNIT - VI

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 uC-OS (open source).

UNIT - VII

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 - VIII

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.

TEXT BOOKS:

1. Wayne Wolf (2008), *Computers as Components-principles of embedded computer system design*, Elsevier, 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.

VARDHAMAN COLLEGE OF ENGINEERING

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I SEMESTER

C# AND .NET FRAMEWORK (Professional Elective - II)

Course Code: B1210

L	P	C
3	-	3

UNIT - I

C# LANGUAGE FUNDAMENTS: Basic class, constructors, composing an application, variable scope, input and output with console class, value types, reference types, system .object, system data types, boxing and unboxing, constants, iteration constructs, flow constructs, operators, class methods, static methods, modifiers, arrays, strings, enumerations, structures, name spaces.

UNIT - II

OBJECT ORIENTED PROGRAMMING WITH C#: Definition of a class, default public interface, encapsulation, read only fields, inheritance support, protected keyword, nested type definitions, polymorphism, type casting, class definitions.

UNIT - III

EXCEPTIONS AND OBJECT LIFETIME: Errors, bugs, exceptions, system. Exception, throwing, catching.system. System exception, system. application exception, handling multiple exceptions, finally, last change system level exceptions, debugging system exceptions, object life time, garbage collection, finalization, destruction method, system. GC type.

UNIT - IV

INTERFACES AND COLLECTIONS, CALLBACK INTERFACES, DELEGATES AND EVENTS: Defining, invoking, exercising hierarchy, interface implementation, building interface hierarchies, understanding iconvertible interface, custom enumerator, icloneable, icomparable, system. Collections, callback interfaces, system. Multicastdelegate, examples, asynchronous delegates, understanding events.

UNIT - V

.NET ASSEMBLY, PROCESSES, APPDOMAINS, CONTEXTS AND THREADS: Overview of .net assembly, cross language inheritance, multi-file assembly, private assembly, xml configuration files, shared assemblies, strong names. Process and threads, interaction with process, system. Appdomain, summarizing processes, appdomains, and context, multi thread programming via delegates, spanning secondary threads, examples, concurrency, lock key word, system. threading. Interlocked type, timer call backs.

UNIT - VI

OBJECT SERIALIZATION AND .NET REMOTING LAYER: Object graphs, serialization using binary formatter, SOAP formatter, xml formatter, .net remoting, object marshaling, MBR objects, MBV objects, asynchronous remoting, onewayattribute.

UNIT - VII

WINDOWS FORMS, WINDOWS FORM CONTROLS: System.windows.forms, interactions with windows forms types, system.windows.forms.application, component class, control class, control events key board events, scrollablecontrol class, containercontrol class, form class, life-cycle, handling form events, menus with windows forms, status bars, tool bar, MDI application, windows forms control hierarchy, controls to forms, text box control, check boxes, radiobuttons, groupboxes, listboxes, comboboxes, monthcalendar control, trackbar, panel controls, dialog boxes, form inheritance.

UNIT - VIII

DATA ACCESS WITH ADO .NET: ADO.net, data providers, system.data, datacolumn type, datarow type, datatable, dataview, dataset, datarelation, XML based dataset, selecting a data provider, system.data.oledb namespace, oledbdatareader, insertion, updation and deletion of records, stored procedures, oledbdataadapter, example.

TEXT BOOKS:

1. Andrew Troelsen (2007), *C# and the .NET Platform*, 2nd edition, Springer (India) Private Limited, New Delhi.

REFERENCE BOOKS:

1. E. Balagurusamy (2004), *Programming in C#*, 5th edition, Tata McGraw-Hill, New Delhi, India.
2. Herbert Schildt (2004), *The Complete Reference: C#*, Tata McGraw-Hill, New Delhi, India.
3. Simon Robinson, Christian Nagel, Karli Watson, Jay Gl (2006), *Professional C#*, 3rd edition, Wiley-India.
Jesse Liberty (2003), *Programming C#*, 3rd edition, O'Reilly Media, Inc.

VARDHAMAN COLLEGE OF ENGINEERING
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I SEMESTER

DATA STRUCTURES AND ALGORITHMS LAB

Course Code: **B1211**

L	P	C
-	3	2

LIST OF EXERCISES:

Exercise 1:

- a) Write a C program that implement stack (its operations) using arrays
- b) Write a C program that uses Stack operations to convert infix expression into postfix expression

Exercise 2:

- a) Write C programs that implement Queue (its operations) using arrays
- b) Write C programs that implement Queue (its operations) using linked lists

Exercise 3:

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

Exercise 4:

Write a C program to perform the following operations:

- a) Insert an element into a binary search tree
- b) Delete an element from a binary search tree
- c) Search for a key element in a binary search tree

Exercise 5:

Write a C program to perform the following operations on B -Trees and AVL-trees:

- a) Insertion
- b) Deletion

Exercise 6:

Write C programs for the implementation of bfs and dfs for a given graph.

Exercise 7:

Write C programs to implement the following to generate a minimum cost spanning tree:

- a) Prim's algorithm
- b) Kruskal's algorithm.

Exercise 8:

Write a C program to solve the single source shortest path problem. (Note: Use Dijkstra's algorithm).

Exercise 9:

Write C program that uses non-recursive functions to traverse a binary tree in:

- a) Pre-order
- b) In-order
- c) Post-order

Exercise 10:

Write a C program to find optimal ordering of matrix multiplication. (Note: Use Dynamic programming method).

Exercise 11:

Consider the problem of eight queens on an (8x8) chessboard. Two queens are said to attack each other if they are on the same row, column, or diagonal. Write a C program that implements backtracking algorithm to solve the problem i.e. place eight non - attacking queens on the board.

Exercise 12:

Write a C program to implement dynamic programming algorithm to solve the all pairs shortest path problem.

Exercise 13:

Write a C program to solve 0/1 knapsack problem using the following:

- a) Greedy algorithm
- b) Dynamic programming algorithm
- c) Backtracking algorithm
- d) Branch and bound algorithm.

Exercise 14:

Write a C program that uses dynamic programming algorithm to solve the optimal binary search tree problem.

Exercise 15:

Write a C program for solving traveling sales persons problem using the following:

- a) Dynamic programming algorithm
- b) The back tracking algorithm
- c) Branch and Bound

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II SEMESTER

DATA WAREHOUSING AND DATA MINING

Course Code: **B1218**

L	P	C
3	-	3

UNIT - I

INTRODUCTION: Data mining, kinds of data, data mining functionalities, classification of data mining systems, data mining primitives, major issues in data mining.

UNIT - II

DATA PREPROCESSING: Descriptive data summarization, data cleaning, data integration and transformation, data reduction, data discretization and concept hierarchy generation.

UNIT - III

DATA WAREHOUSE AND OLAP TECHNOLOGY: What is data warehouse, a multidimensional data model, data warehouse architecture, data warehouse implementation, from data warehouse to data mining.

UNIT - IV

MINING FREQUENT PATTERNS AND ASSOCIATIONS: Basic concepts, efficient and scalable frequent itemset mining methods, mining various kinds of association rules.

UNIT - V

CLASSIFICATION AND PREDICTION: Issues regarding classification and prediction, classification by decision tree induction, bayesian classification, rule based classification, prediction, accuracy and error measures.

UNIT - VI

CLUSTER ANALYSIS: Types of data in cluster analysis, a categorization of major clustering methods, partitioning methods, hierarchical methods, density based methods, grid based methods, model based clustering methods, clustering high dimensional data, outlier analysis.

UNIT - VII

MINING STREAM, TIME SERIES AND SEQUENCE DATA: Mining data streams, mining time series data, mining sequence patterns in biological data.

UNIT - VIII

MINING OBJECT, SPATIAL, MULTIMEDIA, TEXT AND WEB DATA: Multidimensional analysis and descriptive mining of complex data objects, spatial data mining, multimedia data mining, text mining, mining the world wide web.

TEXT BOOKS:

1. Jiawei Han, Micheline Kamber, Jian Pei (2011), *Data Mining Concepts and Techniques*, 3rd edition, Elsevier, New Delhi, India.

REFERENCE BOOKS:

1. Margaret H Dunham (2006), *Data Mining Introductory and Advanced Topics*, 2nd edition, Pearson Education, New Delhi, India.
2. Amitesh Sinha (2007), *Data Warehousing*, Thomson Learning.
3. Arun K Pujari (2004), *Data Mining Techniques*, University Press (India) Private Limited, India.
4. W. H. Inmon (2005), *Building the Data Warehouse*, Wiley Dreamtech India Pvt. Ltd, India.

VARDHAMAN COLLEGE OF ENGINEERING
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II SEMESTER

SOFTWARE QUALITY ASSURANCE AND TESTING

Course Code: **B1505**

L	P	C
3	-	3

UNIT - I

FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE: Ethical basis for software quality, total quality management principles, software processes and methodologies.

UNIT - II

QUALITY STANDARDS: Quality standards, practices and conventions, software configuration management, reviews and audits, enterprise resource planning software.

UNIT - III

QUALITY METRIC SYSTEM: Measurement theory, software quality metrics, designing software measurement programs, complexity metrics and models.

UNIT - IV

ORGANIZATIONAL LEARNING: Improving quality with methodologies, structured/information engineering.

UNIT - V

SOFTWARE TESTING: Introduction testing as an engineering activity, role of process in software quality, testing as a process, basic definitions, software testing principles, the tester's role in a software development organization, origins of defects.

UNIT - VI

DEFECT CLASSES: The defect repository and test design, defect examples, developer/tester support for developing a defect repository.

UNIT - VII

TESTING ISSUES: Introduction to testing design strategies, the smarter tester, test case design strategies, using black box approach to test case design, random testing, equivalence class partitioning, boundary value analysis, other black box.

UNIT - VIII

TEST DESIGN APPROACHES: Black box testing and cots using white box approach to test design, test adequacy criteria, coverage and control flow graphs, covering code logic paths, white box based test design, additional white box test design approaches, evaluating test adequacy criteria.

TEXT BOOKS:

1. Schulmeyer, G. Gordon, James McManus (1992), *Handbook of Software Quality Assurance*, 2nd Edition, Artech House Inc., Norwood, MA.
2. Ilene Burnstein (2003), *Practical Software Testing*, Springer Professional Computing, Springer, NY, USA.

REFERENCE BOOKS:

1. Edward Kit (2008), *Software Testing in the Real World – Improving the Process*, 3rd Edition, Pearson Education, New Delhi, India.
2. William E. Perry (2006), *Effective methods for software testing*, 3rd Edition, Wiley Publication Inc, Indianapolis, New Delhi, India.

VARDHAMAN COLLEGE OF ENGINEERING

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II SEMESTER

SERVICE ORIENTED ARCHITECTURE

Course Code: B1506

L	P	C
3	-	3

UNIT - I

SOA AND WEB SERVICES FUNDAMENTALS: Introducing SOA, fundamental SOA, common characteristics of contemporary SOA, common tangible benefits of SOA, the roots of SOA, web services and primitive SOA, the web services frame work, services, service descriptions, messaging.

UNIT - II

SOA AND WS: * EXTENSIONS:

WEB SERVICES AND CONTEMPORARY SOA (PART-I: ACTIVITY MANAGEMENT AND COMPOSITION): Message exchange patterns, service activity coordination, atomic transactions, business activities, orchestration, choreography.

UNIT - III

WEB SERVICES AND CONTEMPORARY SOA (PART-II: ADVANCED MESSAGING, METADATA, AND SECURITY): Addressing, reliable messaging, correlation, policies, metadata exchange, security, notification and eventing.

UNIT - IV

SOA AND SERVICES ORIENTATION: Principles of Service Orientation - service Orientation and the enterprise, anatomy of SOA, common principles of service orientation, interrelation between principles of service orientation.

SERVICE LAYERS: Service orientation and object orientation, native web services support for principles of service orientation, service layers, business service layer, orchestration service layer, agnostics servies, service layer configuration scenarios.

UNIT - V

BUILDING SOA (PLANNING AND ANALYSIS): SOA delivery strategies, SOA delivery lifecycle phases, the top down strategy, the bottom up strategy, the agile strategy service.

ORIENTED ANALYSIS (PART-I: INTRODUCTION): Introduction to service oriented analysis. Benefits of a business centric SOA, deriving business services.

UNIT - VI

SERVICE ORIENTED ANALYSIS (PART-II: SERVICE MODELLING): Service modeling, service modeling guidelines, classifying service model logic, contrasting service modeling approaches.

UNIT - VII

BUILDING SOA (TECHNOLOGY AND DESIGN):

SERVICE ORIENTED DESIGN (PART-I: INTRODUCTION): Introduction to service oriented design, WSDL related XML schema language basics, WSDL language basics, service interface design tools.

SERVICE ORIENTED DESIGN (PART-II: SOA COMPOSITION GUIDELINES): SOA composing steps, considerations for choosing service layers, considerations for positioning core SOA standards, considerations for choosing SOA extensions.

UNIT - VIII

SERVICE ORIENTED DESIGN (PART-III: SERVICE DESIGN): Service design overview, service design guidelines.

SERVICE ORIENTED DESIGN (PART-IV: BUSINESS PROCESS DESIGN): WS: BPEL Extensions, WS coordination overview, service oriented business process design. Fundamental WS: * extensions, WS addressing language basics, WS reliable messaging language basics, WS policy language basics, WS metadata exchange language basics, WS security language basics, SOA platforms, SOA platform basics, SOA support in J2EE and .NET, integration considerations.

TEXT BOOKS:

1. Norbert Bieberstein, Sanjay Bose, Marc Fiammante, Keith Jones, Rawn Shah (2005), *Service Oriented Architecture Compass - Business Value, Planning, and Enterprise Roadmap*, IBM Press, India.
2. James P Lawler, H. Howell Barber (2008), *Service Oriented Architecture: SOA Strategy, Methodology and Technology*, Auerbach Publications, Taylor & Francis Group, (C), New York, USA.

REFERENCE BOOKS:

1. Thomas Erl (2005), *Service – Oriented Architecture – Concepts, Technology and Design*, 1st Edition, PHI.
2. Eric Newcomes, Greg Lomow (2008), *Understanding SOA with Web Services*, 1st Edition, Pearson Education, New Delhi, India.
3. A. Jeff Davies (2007), *The Definitive guide to SOA*, Dreamtech publications, India.
4. J. Mc Govern (2008), *Java Web Services Architecture*, Morgan Kaufmann Publishers, Elsevier, USA.
5. Shankar. K (2009), *SOA for Enterprise Applications*, Wiley India Edition.

VARDHAMAN COLLEGE OF ENGINEERING

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II SEMESTER

SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

Course Code: B1507

L	P	C
3	-	3

UNIT - I

ENVISIONING ARCHITECTURE: The architecture business cycle, what is software architecture, architectural patterns, reference models, reference architectures, architectural structures and views.

CREATING ARCHITECTURE: Quality attributes, achieving qualities, architectural styles and patterns, designing the architecture, documenting software architectures, reconstructing software architecture.

UNIT - II

ANALYZING ARCHITECTURES: Architecture evaluation, architecture design decision making, ATAM, CBAM.

UNIT - III

MOVING FROM ONE SYSTEM TO MANY: Software product lines, building systems from off the shelf components, software architecture in future.

UNIT - IV

PATTERNS: Pattern description, organizing catalogs, role in solving design problems, selection and usage.

CREATIONAL PATTERNS: Abstract factory, builder, factory method, prototype, singleton.

UNIT - V

STRUCTURAL PATTERNS: Adapter, bridge, composite, façade, flyweight, proxy.

UNIT - VI

BEHAVIORAL PATTERNS PART-I: Chain of responsibility, command, Interpreter, iterator, mediator, memento.

UNIT - VII

BEHAVIORAL PATTERNS PART-II: observer, state, strategy, template method, visitor.

UNIT - VIII

CASE STUDIES: A-7E - A case study in utilizing architectural structures, the world wide web - a case study in interoperability, air traffic control – a case study in designing for high availability, Celsius tech - a case study in product line development.

TEXT BOOKS:

1. Len Bass, Paul Clements, Rick Kazman (2010), *Software Architecture in Practice*, 9th edition, Pearson Education, South Asia.
2. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides (2009), *Design Patterns*, Pearson education, 6th Edition, USA.

REFERENCE BOOKS:

1. Luke Hohmann, Addison Wesley (2003), *Beyond Software architecture*, 9th edition, Addison Wesley, USA.
2. David M. Dikel, David Kane and James R. Wilson (2001), *Software architecture*, Prentice Hall PTR, USA.
3. F. Buschmann (2007), *Pattern Oriented Software Architecture*, John Wiley & Sons, England.
4. Eric Freeman, Elisabeth Freeman (2007), *Head First Design patterns*, O'REILLY.
5. Steven John Metsker, William C. Wake (2006), *Design Patterns in Java*, Pearson education, India.

VARDHAMAN COLLEGE OF ENGINEERING

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II SEMESTER

CLOUD COMPUTING (Professional Elective - III)

Course Code: B1217

L	P	C
3	-	3

UNIT - I

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

UNIT - II

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 - III

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.

UNIT - IV

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

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

UNIT - V

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

STANDARDS: Application, client, infrastructure, service.

UNIT - VI

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 - VII

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.

UNIT - VIII

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*, Mc Graw 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

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II SEMESTER

MULTIMEDIA AND RICH INTERNET DEVELOPMENT (Professional Elective - III)

Course Code: B1508

L	P	C
3	-	3

UNIT - I

INTRODUCTION TO MULTIMEDIA: Internet and multimedia communications, multimedia networks, multimedia applications, multimedia information representation, digitization principles, text, images, audio and video compression methods, basic coding methods run length coding, huffman coding, arithmetic coding, discrete cosine transform, differential PCM, motion compensated prediction, video compression - JPEG, H.261, MPEG-I Video, MPEG-2 and 3 Video, H.263, wavelet and fractal image compression audio compression.

UNIT - II

MULTIMEDIA APPLICATIONS IN NETWORKS: Introduction, application level framing, audio / video conferencing, session directories, audio / video conferencing, adaptive applications, receiver heterogeneity, real time application with resource reservation video server.

UNIT - III

APPLICATIONS REQUIRING RELIABLE MULTICAST: White board, network text editor for shared text editing, multi talk, multicast file transfer, multimedia applications on the world wide web, multicast web page sharing, audio / video streams in the www, interactive multiplayer games.

UNIT - IV

WHAT IS WEB 2.0: Search, content networks, user generated content, blogging, social networking, social media, tagging, social marking, rich internet applications, web services, mashups, location based services.

UNIT - V

XML, RSS, ATOM, JSON, and VoIP, Web 2.0 monetization and business models, future of the web.

UNIT - VI

RICH INTERNET APPLICATIONS (RIAS) WITH ADOBE FLASH AND FLEX: Adobe flash, introduction, flash movie development, learning flash with hands on examples, publish your flash movie, creating special effects with flash, creating a website splash screen.

UNIT - VII

ACTION SCRIPT : Web sources, adobe flex 2, introduction, flex platform overview, creating a simple user interface, accessing XML data from your application, interacting with server side applications, customizing your user interface, creating charts and graph, connection independent rias on the desktop, adobe integrated runtime (air), flex 3 beta.

UNIT - VIII

AJAX - ENABLED RICH INTERNET APPLICATION: Introduction, traditional web applications vs. Ajax application, rich internet application with Ajax, history of Ajax, raw Ajax example using XmlHttpRequest object, using XML, creating a full scale Ajax enabled application, dojo tool kit.

TEXT BOOKS:

1. Franklin F Kuo, J. Joaquin Garcia, Wolf Gang Effelsberg (1998), *Multimedia Communications, Protocols and Applications*, Prentice Hall Publications, NJ, USA.
2. Fred Halsall, Addison (2001), *Multimedia Communications - Applications, Networks, Protocols and Standards*, Wesley Publications, England.

REFERENCE BOOKS

1. Paul J Deitel, Harvey M Deitel (2008), *AJAX Rich Internet Applications, and Web Development for Programmers*, 2nd edition, Deitel Developer Series, Pearson Education, MA.
2. Rich Tretola, Simon barber a, Renaun Erickson, Wrox (2002), *Professional Adobe Flex 2*, Wiley India Edition.
3. Nalin K Sharda (2005), *Multimedia Information Networking*, PHI Learning, India.
4. Ralf Steinmetz, Klara Nahrstech (2006), *Multimedia Computing, Communications & Applications*, Pearson Education, India.

VARDHAMAN COLLEGE OF ENGINEERING

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II SEMESTER

NETWORK SECURITY AND CRYPTOGRAPHY

(Professional Elective - III)

Course Code: B1509

L	P	C
3	-	3

UNIT - I

INTRODUCTION SECURITY ATTACKS: Interruption, interception, modification and fabrication.

SECURITY SERVICES: Confidentiality, authentication, integrity, non repudiation, access control and availability.

SECURITY MECHANISMS: A model for internetwork security, internet standards and RFCs, conventional encryption principles, ceaser cipher, hill cipher, poly and mono alphabetic cipher.

UNIT - II

ENCRYPTION PRINCIPLES: Conventional encryption algorithms: Feistel structure, DES algorithm, S: Boxes, Triple DES, advanced data encryption standard (AES), cipher block modes of operation, location of encryption devices, Key distribution Approaches.

UNIT - III

CRYPTOGRAPHY AND APPLICATIONS : Public key cryptography principles, public key cryptography algorithms, digital signatures, RSA, elliptic algorithms, digital certificates, certificate authority and key management, Kerberos, X.509, directory authentication service. Message authentication, secure hash functions and HMAC.

UNIT - IV

ELECTRONIC MAIL SECURITY: Email privacy, PGP operations, radix: 64 conversions, key management for PGP, PGP trust model, multipurpose internet mail extension (MIME), secure/MIME(S/MIME).

UNIT - V

IP SECURITY ARCHITECTURE AND SERVICES: IP security overview, IP security architecture, security association, authentication header, encapsulating security payload, combining security associations and key management, OAKELY key determination protocol, ISAKMP.

UNIT - VI

WEB SECURITY: Web security considerations, secure socket layer (SSL) and transport layer security (TLS), secure electronic transaction (SET).

UNIT - VII

NETWORK MANAGEMENT SECURITY: Basic concepts of SNMP, SNMPv1 community facility and SNMPv3. System Security, intruders, intrusion techniques, intrusion detection, password management, bot nets.

UNIT - VIII

MALICIOUS SOFTWARE: Viruses and related threats, virus counter measures, distributed denial of service attacks.

FIREWALLS: Firewall design principles, trusted systems, common criteria for information technology security evolution.

TEXT BOOKS:

1. William Stallings (2007), *Network Security Essentials (Applications and Standards)*, 3rd Edition, Pearson Education, New Delhi, India.
2. William Stallings (1998), *Cryptography and network Security*, 3rd Edition, Prentice Hall of India, New Delhi, India.

REFERENCE BOOKS:

1. Eric Maiwald (2004), *Fundamentals of Network Security*, Dreamtech press, India.
2. Charlie Kaufman, Radia Perlman, Mike Speciner (2002), *Network Security: Private Communication in a Public World*, 2nd Edition, Pearson Education, India.
3. Robert Bragg, Mark Rhodes (2004), *Network Security: The Complete Reference*, Tata Mcgraw Hill, New Delhi.
4. Buchmann (2004), *Introduction to Cryptography*, 2nd Edition, Springer, USA.

VARDHAMAN COLLEGE OF ENGINEERING

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II SEMESTER

MODERN COMPILERS - THEORY AND PRACTICE (Professional Elective - IV)

Course Code: B1219

L	P	C
3	-	3

UNIT - I

OVERVIEW OF COMPILATION: Phases of compilation, lexical analysis, regular grammar and regular expression for common programming language features, pass and phases of translation, interpretation, bootstrapping, data structures in compilation, LEX lexical analyzer generator.

UNIT - II

PARSING: Context free grammars, top down parsing - backtracking, LL (1), recursive descent parsing, predictive parsing, preprocessing steps required for predictive parsing.

UNIT - III

BOTTOM UP PARSING: Shift reduce parsing, LR and LALR parsing, error recovery in parsing, handling ambiguous grammar, YACC - automatic parser generator.

UNIT - IV

SYNTAX DIRECTED TRANSLATION: Syntax directed definition, construction of syntax trees, S-attributed and L-attributed definitions, 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 - V

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, language facilities for dynamic storage allocation.

UNIT - VI

CODE OPTIMIZATION: Consideration for optimization, machine dependent and machine independent code optimization, scope of optimization, local optimization, frequency reduction, folding, DAG representation.

UNIT - VII

CODE GENERATOR: Processing the intermediate code, interpretation, code generation, simple code generation, code generation for basic blocks, BURS code generation and dynamic programming, register allocation by graph coloring, evaluation of code generation techniques preprocessing the intermediate code, post processing the target code, machine code generation.

UNIT - VIII

DATA FLOW ANALYSIS: Dataflow analysis, intermediate representation for flow analysis, various dataflow analyses. Transformations using dataflow analysis speeding up dataflow analysis, alias analysis.

LOOP OPTIMIZATION: Dominators, loop invariant computations, induction variables, array bounds checks, loop unrolling.

TEXT BOOKS:

1. A. V. Aho, Ravi Sethi, J. D. Ullman(2008), *Compilers principles, techniques and tools* , 2nd edition, Pearson Education, India.
2. Kenneth C. Loudon (1997), *Compiler Construction Principles and Practice*, 1st edition, Course Technology, India.

REFERENCE BOOKS:

1. Dick Grune, Henry E. Bal, Cariel J. H. Jacobs, Koen G. Langendoen(2003), *Modern compiler design*, wiley Dreamtech, India.
2. Keith D. Cooper, Linda Torczon (2003), *Engineering a Compiler*, Elsevier, USA.
3. K. L. P Mishra, N. Chandrashekar (2003), *Theory of computer science Automata Languages and computation*, 2nd edition, Prentice Hall, India.

VARDHAMAN COLLEGE OF ENGINEERING

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II SEMESTER

DISTRIBUTED COMPUTING (Professional Elective - IV)

Course Code: B1220

L	P	C
3	-	3

UNIT - I

INTRODUCTION: The different forms of computing, monolithic, distributed, parallel and cooperative computing, the meaning of distributed computing, examples of distributed systems, the strengths and weaknesses of distributed computing, operating system concepts relevant to distributed computing, the architecture of distributed applications.

UNIT - II

DISTRIBUTED COMPUTING PARADIGMS: Paradigms for distributed applications, message passing paradigm, the client-server paradigm (java socket API), the peer-to-peer paradigm

MESSAGE SYSTEM (MOM) PARADIGM: The point-to-point message model and the publish/subscribe message model, RPC model.

UNIT - III

THE DISTRIBUTED OBJECTS PARADIGMS: RMI, ORB, the object space paradigm, the mobile agent paradigm, the network services paradigm, the collaborative application (groupware paradigm), choosing a paradigm for an application.

UNIT - IV

DISTRIBUTED OBJECTS PARADIGM (RMI): Message passing versus distributed objects, an archetypal distributed object architecture, distributed object systems, RPC, RMI, the java RMI architecture, java RMI API, a sample RMI application, steps for building an RMI application, testing and debugging, comparison of RMI and socket API.

UNIT - V

DISTRIBUTED OBJECT PARADIGM(CORBA): The basic architecture, the CORBA object interface, inter-ORB protocols, object servers and object clients, CORBA object references, CORBA naming service and the interoperable naming service, CORBA object services, object adapters, java IDL, an example CORBA application.

UNIT - VI

DISTRIBUTED DOCUMENT BASED SYSTEMS: WWW, lotus notes, comparison of WWW and lotus notes.

DISTRIBUTED COORDINATION BASED SYSTEMS: Introduction to coordination models, TIB, JINI, comparison of TIB and JINI, software agents, agent technology, mobile agents.

DISTRIBUTED MULTIMEDIA SYSTEMS: Characteristics of multimedia data, QOS of service management, resource management, stream adaptation.

UNIT - VII

GRID COMPUTING: Definition of grid, grid types, computational grid, data grid, grid benefits and applications, drawbacks of grid computing, grid components, grid architecture and its relation to various distributed technologies.

UNIT - VIII

CLUSTER COMPUTING: Parallel computing overview, cluster computing – introduction, cluster architecture, parallel programming models and paradigms, applications of clusters.

TEXT BOOKS:

1. M. L. Liu (2004), *Distributed Computing Principles and Applications*, 1st Edition, Pearson Education, India.
2. R. Orfali, Dan Harkey, Jeri Edwards (1999), *Client/Server Programming with Java and CORBA*, 3rd Edition, John Wiley, New York, USA.

REFERENCE BOOKS:

1. J. Joseph, C. Fellenstein (2009), *Grid Computing*, 5th Edition, Pearson education, India.
2. Rajkumar Buyya (2008), *High Performance Cluster Computing*, 2nd Edition, Pearson education.
3. D. Minoli (2005), *A Networking Approach to Grid Computing*, 1st Edition, Wiley & sons, New Jersey, USA.
4. A. Abbas (2004), *Grid Computing: A Practical Guide to Technology and Applications*, 1st Edition, Firewall Media, New Delhi, India.
5. G. Coulouris, J. Dollimore and Tim Kindbirg (2005), *Distributed Systems Concepts and Design*, 4th Edition, Wiley & sons, New Jersey, USA.

VARDHAMAN COLLEGE OF ENGINEERING

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II SEMESTER

SEMANTIC WEB AND SOCIAL NETWORKING (Professional Elective - IV)

Course Code: **B1510**

L	P	C
3	-	3

UNIT - I

WEB INTELLIGENCE: Thinking and intelligent web applications, the information age, the world wide web, limitations of today's web.

UNIT - II

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 - III

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 - IV

ONTOLOGY ENGINEERING: Ontology engineering, constructing ontology, ontology development tools, ontology methods, ontology sharing and merging, ontology libraries and ontology mapping, logic, rule and inference engines.

UNIT - V

SEMANTIC WEB APPLICATIONS, SERVICES AND TECHNOLOGY: Semantic web applications and services, semantic search, e - learning, semantic bioinformatics.

UNIT - VI

KNOWLEDGE BASE, XML BASED: Web services, creating an OWL: S ontology for web services, semantic search technology, web search agents and semantic methods.

UNIT - VII

SOCIAL NETWORK ANALYSIS AND SEMANTIC WEB: What is social networks analysis, development of the social networks analysis.

UNIT - VIII

ELECTRONIC SOURCES FOR NETWORK ANALYSIS: Electronic discussion networks, blogs and online communities, web based networks. Building semantic web applications with social network features.

TEXT BOOKS:

1. Berners Lee, Godel, Turing (2008), *Thinking on the Web*, Wiley interscience, USA.
2. Peter Mika (2007), *Social Networks and the Semantic Web*, Springer, USA.

REFERENCE BOOKS:

1. J .Davies, Rudi Studer, Paul Warren (2006), *Semantic Web Technologies Trends and Research in Ontology Based Systems*, John Wiley & Sons, NJ, USA.
2. Heiner Stucke Schmidt, Frank Van Harmelen (2005), *Information sharing on the semantic Web*, Springer Publications, Germany.
3. T. Segaran, C. Evans, J .Taylor (2009), *Programming the Semantic Web*, O' Reilly, SPD, California, USA.

VARDHAMAN COLLEGE OF ENGINEERING

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II SEMESTER

SOFTWARE TESTING AND CASE TOOLS LAB

Course Code: B1511

L	P	C
-	3	2

SOFTWARE TESTING LAB:

LIST OF TASKS:

1. Generate meaningful Unit test cases for the Project module: write and test them for defects, Identify the defects from the code and correct them. Try Identify the various unit test metrics studied already to identify module stability. Fill the unit test report supplied by the instructor.
2. Generate meaningful Integration test cases for the Project and test them for defects, Identify the defects and correct them. Try Identify the various Integration test metrics studied already to identify module stability. Fill the Integration test report supplied by the instructor.
3. Generate meaningful System test cases for the Project and test them for defects, Identify the defects and correct them. Try Identify the various System test metrics studied already to identify system stability. Fill the System test report supplied by the instructor.
4. Generate meaningful User Acceptance cases for the Project and test them for defects, Identify the defects and correct them. Try Identify the various System test metrics studied already to identify system stability. Fill the System test report supplied by the instructor.
5. Test the supplied project/Application through testing tool: Win Runner, by generating appropriate test cases.

CASE TOOLS LAB:

OBJECTIVE

- To inculcate object oriented software design

SYSTEM/ SOFTWARE REQUIREMENT

- Tools Such as Rational Rose.

CASE STUDY 1: LIBRARY INFORMATION SYSTEM

Problem Statement

A library lends books and magazines to members, who are registered in the system. Also it handles the purchase of new titles for the library. Popular titles are bought in multiple copies. A member can reserve a book or magazine that is not currently available in the library, so that when it is returned by the library that person is notified. The library can easily create, update and delete information about the titles, members, loans and reservations in the systems.

CASE STUDY 2: A POINT OF SALE (POS) SYSTEM

Problem Statement

A POS System is a computerized application used to record sales and handle payments; it is typically used in a retail store. It includes hardware components such as a computer and bar code scanner, and software to run the system. It interfaces to various service applications, such as a third party tax calculator and inventory control. These systems must be relatively fault tolerant; that is, even if remote services and temporarily unavailable they must still be of capturing sales and handling at least cash payments. A POS system must support multiple and varied client side terminals and interfaces such as browser, PDA's, touch screens.

CASE STUDY 3: AUTOMATED TELLER MACHINE (ATM)

Problem Statement

Software is designed for supporting a computerized ATM banking network. All the process involved in the bank is computerized these days. All the accounts maintained in the bank and also the transactions effected, including ATM transactions are to be processed by the computers in the bank. An ATM accepts a relevant cash card, interacts with user, communicates with the central system to carry out the transaction, dispenses cash, and prints receipts. The system to be designed and implemented must include appropriate record keeping and security provisions. The system must handle concurrent access to the same account.

CASE STUDY 4: ONLINE TICKET RESERVATION FOR RAILWAYS

Problem Statement

Computer play an integral part of the day in today's life. It makes the entire job easier and faster, every job is computerized so as the ticket reservation we can book over the online ticket reservation system. During the booking of the ticket reservation passenger has to select origin, date of journey, destination, class of train etc. The reservation counter keeps track of passenger's information. Thus the system will have all the details about the trains and facilities provided by them. There are various trains with the different level of convenience for the passengers. The whole database will be maintained by database administrator. There are varieties of trains where the passengers can select the train according to the convenience for their destination journey. The journey could be within the state or across the India. Each train has the three types of classes i.e. Sleeper class, First class and the AC compartment. Design the application for the above problem description.

CASE STUDY 5: RECRUITMENT PROCEDURE FOR SOFTWARE INDUSTRY

Problem Statement

In the software industry the recruitment procedure is the basic thing that goes in the hand with the requirement as specified by the technical management team. HR first gives an advertisement in leading Newspapers, Journals, Weeklies and Websites. The job seekers can apply for it through by Post or by e: mail to the company.

The technical skill and the experience of the candidates are reviewed and the short listed candidates are called for the interview.

There may be different rounds for interview like the written test, technical interview, HR interview. After the successful completion of all rounds of interview, the selected candidates names are displayed. Mean while HR gives all the details about the salary, working hours, terms and conditions and the retirement benefit to the candidate.

Note : The analysis, design, coding, documentation, database design of mini project which will be carried out in 4th year should be done in object oriented approach using UML and by using appropriate software which supports UML, otherwise the mini project will not be evaluated.

1. OBJECTIVE:

Seminar is an important component of learning in an Engineering College, where the student gets acquainted with preparing a report & presentation on a topic.

2. PERIODICITY / FREQUENCY OF EVALUATION: Twice**3. PARAMETERS OF EVALUATION:**

- 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.
- 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.
- The students shall be required to submit the rough drafts of the seminar outputs within one week of the commencement of the class work.
- Supervisor shall make suggestions for modification in the rough draft. The final draft shall be presented by the student within a week thereafter.
- Presentation schedules will be prepared by different Departments in line with the academic calendar.

The Seminars shall be evaluated in two stages as follows:

A. Rough draft

In this stage, the student should collect information from various sources on the topic and collate them in a systematic manner. He/ She may take the help of the concerned supervisor.

The report should be typed in "MS-Word" file with "calibri" font, with font size of 16 for main heading, 14 for sub-headings and 11 for the body text. The contents should also be arranged in Power Point Presentation with relevant diagrams, pictures and illustrations. It should normally contain 18 to 25 slides, consisting of the followings:

1.	Topic, name of the student & guide	1 Slide
2.	List of contents	1 Slide
3.	Introduction	1 - 2 Slides
4.	Descriptions of the topic (point-wise)	7 - 10 Slides
5.	Images, circuits etc.	6 - 8 Slides
6.	Conclusion	1 - 2 Slides
7.	References/Bibliography	1 Slide

The soft copy of the rough draft of the seminar presentation in MS Power Point format along with the draft Report should be submitted to the concerned supervisor, with a copy to the concerned HOD within 30 days of the commencement of class work.

The evaluation of the Rough draft shall generally be based upon the following.

1.	Punctuality in submission of rough draft and discussion	2 Marks
2.	Resources from which the seminar have been based	2 Marks
3.	Report	3 Marks
4.	Lay out, and content of Presentation	3 Marks
5.	Depth of the students knowledge in the subject	5 Marks
Total		15 Marks

After evaluation of the first draft the supervisor shall suggest further reading, additional work and fine tuning, to improve the quality of the seminar work.

Within 7 days of the submission of the rough draft, the students are to submit the final draft incorporating the suggestions made by the supervisor.

B. Presentation:

After finalization of the final draft, the students shall be allotted dates for presentation (in the designated seminar classes) and they shall then present it in presence students, supervisor, faculties of the department and at least one faculty from some department / other department.

The student shall submit 3 copies of the Report neatly bound along with 2 soft copies of the PPT in DVD medium. The students shall also distribute the title and abstract of the seminar in hard copy to the audience. The final presentation has to be delivered with 18-25 slides.

The evaluation of the Presentation shall generally be based upon the following.

1.	Contents	10 Marks
2.	Delivery	10 Marks
3.	Relevance and interest the topic creates	5 Marks
4.	Ability to involve the spectators	5 Marks
5.	Question answer session	5 Marks
Total		35 Marks

4. WHO WILL EVALUATE?

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 / other department.

1. OBJECTIVE:

- To enable the examiners to assess the candidate's knowledge in his or her particular field of learning.
- To test the student's awareness of the latest developments and relate them to the knowledge acquired during the classroom teaching.

2. PARAMETERS OF EVALUATION:

Subject Knowledge	Current Awareness	Career Orientation	Communication Skills	Total
20	10	10	10	50

3. WHO WILL EVALUATE?

The comprehensive Viva will be conducted by a committee comprising Head of the Department or his/her nominee, two senior faculty of the respective department and an external examiner from outside the college. The comprehensive viva shall be evaluated for 50 marks at the end of III semester. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits.

4. PERIODICITY / FREQUENCY OF EVALUATION: Once**5. PEDAGOGY:**

- The viva will be held on a face to face basis.
- The students will be expected to answer the questions related to latest developments and all courses taken till date.
- Viva voce will be conducted within week before the beginning of midterm examinations. However, in exceptional circumstances it can be scheduled immediately after the end of midterm examinations.
- Students will have to make themselves available on the date of the viva voce.

M. Tech. SE III/ IV SEMESTER

PROJECT WORK

1. OBJECTIVE:

The main objective of the Project Work is for the students to learn and experience all the major phases and processes involved in solving "real life engineering problems".

2. EXPECTED OUTCOME:

The major outcome of the M. Tech project must be well-trained students. More specifically students must have acquired:

- System integration skills
- Documentation skills
- Project management skills
- Problem solving skills

3. PROJECT SELECTION:

Projects are suggested by the faculty, with or without collaboration with an industry. All faculty are to suggest projects. Students are also encouraged to give project proposals after identifying a faculty who would be willing to supervise the work. A Project brief is to be given by the faculty to the group defining the project comprehensively.

All M. Tech major projects are to be done in the Institute. For industry specified projects, students will be permitted to spend 1-2 weeks in the industry on recommendation by the supervisor. The number of students per batch should be 1.

4. WHO WILL EVALUATE?

The end semester examination shall be based on the report submitted and a viva-voce exam for 100 marks by committee comprising of the Head of the Department, project supervisor and an external examiner.

5. EVALUATION:

The basic purpose is to assess the student competencies with regard to his project work. More specifically to assess the student's individual contribution to the project, to establish the level of understanding of basic theoretical knowledge relevant to the project and to ensure that the student has good understanding and appreciation of design and development decisions taken in the course of the project. It is desirable that all faculty members are present for the evaluations as this is a platform to get to know the student projects and to motivate the students to do good projects. The faculty should adopt a clear and consistent pattern of asking questions from general to specific aspects of the project. The presentation and evaluation is open to other students of the department.

The project work shall be evaluated for 150 marks out of which 50 marks for internal evaluation and 100 marks for end-semester evaluation. The evaluation shall be done on the following basis

Semester III	Semester IV
Preliminary Evaluation - 50 marks	Design Evaluation I - 25 marks
	Design Evaluation II - 25 marks
	Final Evaluation – 100 marks

6. GUIDELINES FOR THE PREPARATION OF M. TECH PROJECT REPORTS

1.1. Project reports should be typed neatly only on one side of the paper with 1.5 or double line spacing on a A4 size bond paper (210 x 297 mm). The margins should be: Left - 1.25", Right - 1", Top and Bottom - 0.75".

1.2. The total number of reports to be prepared are:

- One copy to the department

- One copy to the concerned guide(s)
 - One copy to the candidate.
- 1.3. Before taking the final printout, the approval of the concerned guide(s) is mandatory and suggested corrections, if any, must be incorporated.
- 1.4. For making copies dry tone Xerox is suggested.
- 1.5. Every copy of the report must contain
- Inner title page (White)
 - Outer title page with a plastic cover
 - Certificate in the format enclosed both from the college and the organization where the project is carried out.
 - An abstract (synopsis) not exceeding 100 words, indicating salient features of the work.
- 6.6. The organization of the report should be as follows:

1.	Inner title page	Usually numbered in roman
2.	Abstract or Synopsis	
3.	Acknowledgments	
4.	Table of Contents	
5.	List of table & figures (optional)	

- 6.7. Chapters (to be numbered) containing Introduction, which usually specifies the scope of work and its importance and relation to previous work and the present developments, Main body of the report divided appropriately into chapters, sections and subsections.
- The chapters, sections and subsections may be numbered in the decimal form for e.g. Chapter 2, sections as 2.1, 2.2 etc., and subsections as 2.2.3, 2.5.1 etc.
 - The report should be typed in “MS-Word” file with “calibri” font. The chapter must be left or right justified (font size 16). Followed by the title of chapter centered (font size 18), section/subsection numbers along with their headings must be left justified with section number and its heading in font size 16 and subsection and its heading in font size 14. The body or the text of the report should have font size 11.
 - The figures and tables must be numbered chapter wise for e.g.: Fig. 2.1 Block diagram of a serial binary adder, Table 3.1 Primitive flow table, etc.
 - The last chapter should contain the summary of the work carried, contributions if any, their utility along with the scope for further work.
- 6.8. Reference OR Bibliography:** The references should be **numbered serially** in the order of their occurrence in the text and their numbers should be indicated within square brackets for e.g. [3]. The section on references should list them in serial order in the following format.
1. For textbooks - A.V. Oppenheim and R.W. Schafer, Digital Signal Processing, Englewood, N.J., Prentice Hall, 3 Edition, 1975.
 2. For papers - Devid, Insulation design to combat pollution problem, Proc of IEEE, PAS, Vol 71, Aug 1981, pp 1901-1907.
- 6.9. Only SI units are to be used in the report. Important equations must be numbered in decimal form for e.g. $V = IZ$ **(3.2)**
- 6.10. All equation numbers should be right justified.
- 6.11. The project report should be brief and include descriptions of work carried out by others only to the minimum extent necessary. Verbatim reproduction of material available elsewhere should be strictly avoided. Where short excerpts from published work are desired to be included, they should be within quotation marks appropriately referenced.
- 6.12. Proper attention is to be paid not only to the technical contents but also to the organization of the report and clarity of the expression. Due care should be taken to avoid spelling and typing errors. The student should note that report-write-up forms the important component in the overall evaluation of the project

- 6.13. Hardware projects must include: the component layout, complete circuit with the component list containing the name of the component, numbers used, etc. and the main component data sheets as Appendix. At the time of report submissions, the students must hand over a copy of these details to the project coordinator and see that they are entered in proper registers maintained in the department.
- 6.14. Software projects must include a virus free disc, containing the software developed by them along with the read me file. Read me file should contain the details of the variables used, salient features of the software and procedure of using them: compiling procedure, details of the computer hardware/software requirements to run the same, etc. If the developed software uses any public domain software downloaded from some site, then the address of the site along with the module name etc. must be included on a separate sheet. It must be properly acknowledged in the acknowledgments.
- 6.15. Sponsored Projects must also satisfy the above requirements along with statement of accounts, bills for the same duly attested by the concerned guides to process further, They must also produce NOC from the concerned guide before taking the internal viva examination.
- 6.16. The reports submitted to the department/guide(s) must be hard bounded, with a plastic covering.
- 6.17. Separator sheets, used if any, between chapters, should be of thin paper

VARDHAMAN COLLEGE OF ENGINEERING

(Autonomous)

Shamshabad – 501 218, Hyderabad

Department of

CERTIFICATE

Certified that the project work entitled carried out by Mr./Ms., Roll Number, a bonafide student ofin partial fulfillment for the award of **Master of Technology** in of the Jawaharlal Nehru Technological University, Hyderabad during the year It is certified that all corrections / suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Name & Signature of the Guide

Name Signature of the HOD

Signature of the Principal

External Viva

Name of the examiners

- 1.
- 2.

Signature with date

Certificate issued at the Organization where the project was carried out

(On a separate sheet, If applicable)

NAME OF THE INDUSTRY / ORGANIZATION, Address with pin code

CERTIFICATE

Certified that the project work entitled carried out by
Mr./Ms, Roll Number....., a bonafide student of
.....in partial fulfillment for the award of **Master of Technology** in
..... of the Jawaharlal Nehru Technological University, Hyderabad
during the year It is certified that, he/she has completed the project satisfactorily

Name & Signature of the Guide

Name & Signature of the Head of Organization

7. DISTRIBUTION OF MARKS FOR M.TECH DISSERTATION EVALUATION

S No.	Particulars	Max. Marks
1	Relevance of the subject in the present context	10
2	Literature Survey	10
3	Problem formulation	10
4	Experimental observation / theoretical modeling	10
5	Results – Presentation & Discussion	20
6	Conclusions and scope for future work	10
7	Overall presentation of the Thesis / Oral presentation	20
8	Project Report Writing	10
Total Marks		100

MALPRACTICES RULES
DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	Punishment
	<i>If the candidate:</i>	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the University.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer:in charge or any person on duty in or outside the examination hall of any injury to his person or to	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their

	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.	seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment.	

Frequently asked Questions and Answers about autonomy

- 1. Who grants Autonomy? UGC, Govt., AICTE or University**
In case of Colleges affiliated to a university and where statutes for grant of autonomy are ready, it is the respective University that finally grants autonomy.
- 2. Shall VCE award its own Degrees?**
No. Degree will be awarded by Jawaharlal Nehru Technological University, Hyderabad with a mention of the name Vardhaman College of Engineering on the Degree Certificate.
- 3. What is the difference between a Deemed University and an Autonomy College?**
A Deemed University is fully autonomous to the extent of awarding its own Degree. A Deemed University is usually a Non: Affiliating version of a University and has similar responsibilities like any University. An Autonomous College enjoys Academic Autonomy alone. The University to which an autonomous college is affiliated will have checks on the performance of the autonomous college.
- 4. How will the Foreign Universities or other stake – holders know that we are an Autonomous College?**
Autonomous status, once declared, shall be accepted by all the stake holders. Foreign Universities and Indian Industries will know our status through our college website.
- 5. What is the change of Status for Students and Teachers if we become Autonomous?**
An autonomous college carries a prestigious image. Autonomy is actually earned out of continued past efforts on academic performances, capability of self:governance and the kind of quality education we offer.
- 6. Who will check whether the academic standard is maintained / improved after Autonomy? How will it be checked?**
There is a built in mechanism in the autonomous working for this purpose. An Internal Committee called Academic Programme Evaluation Committee is a Non – Statutory body, which will keep a watch on the academics and keep its reports and recommendations every year. In addition to Academic Council, the highest academic body also supervises the academic matters. At the end of three years, there is an external inspection by the University for this purpose. The standards of our question papers, the regularity of academic calendar, attendance of students, speed and transparency of result declaration and such other parameters are involved in this process.
- 7. Will the students of VCE as an Autonomous College qualify for University Medals and Prizes for academic excellence?**
No. VCE has instituted its own awards, medals, etc. for the academic performance of the students. However for all other events like sports, cultural and co:curricular organized by the University the students shall qualify.
- 8. Can VCE have its own Convocation?**
No, since the University awards the Degree the Convocation will be that of the University.
- 9. Can VCE give a provisional degree certificate?**
Since the examinations are conducted by VCE and the results are also declared by VCE, the college sends a list of successful candidates with their final percentage of marks to the University. Therefore with the prior permission of the University the college will be entitled to give the provisional certificate.
- 10. Will Academic Autonomy make a positive impact on the Placements or Employability?**
Certainly. The number of students qualifying for placement interviews is expected to improve, due to rigorous and repetitive classroom teaching and continuous assessment, besides the autonomous status is more responsive to the needs of the industry. As a result, there will be a lot of scope for

industry oriented skill development built into the system. The graduates from an autonomous college will therefore represent better employability.

- 11. What is the proportion of Internal and External Assessment as an Autonomous College?**
Presently, it is 25 % for internal assessment and 75 % for external assessment. As the autonomy matures the internal assessment component shall be increased at the cost of external assessment.
- 12. Will there be any Revaluation or Re:Examination System?**
No. There will not be any Revaluation system or Re:examination. But, there is a personal verification of the answer scripts.
- 13. How fast Syllabi can be and should be changed?**
Autonomy allows us the freedom to change the syllabi as often as we need.
- 14. Will the Degree be awarded on the basis of only final year performance?**
No. The percentage of marks will reflect the average performance of all the semesters put together.
- 15. Who takes Decisions on Academic matters?**
The Academic Council of College is the top academic body and is responsible for all the academic decisions. Many decisions are also taken at the lower level like the BOS which are like Boards of Studies of the University.
- 16. What is the role of Examination committee?**
The Exam Committee is responsible for the smooth conduct of inter and external examinations. All matters involving the conduct of examinations, spot valuations, tabulations, preparation of Memorandum of Marks etc fall within the duties of the Examination Committee.
- 17. Is there any mechanism for Grievance Redressal?**
Yes, the college has grievance redressal committee, headed by a senior faculty member of the college.
- 18. How many attempts are permitted for obtaining a Degree?**
All such matters are defined in Rules & Regulations.
- 19. Who declares the result?**
The result declaration process is also defined. After tabulation work the entire result is reviewed by the Moderation Committee. Any unusual deviations or gross level discrepancies are deliberated and removed. The entire result is discussed in the College Academic Council for its approval. The result is then declared on the college notice boards as well put on the web site of the college. It is eventually sent to the University.
- 20. What is our relationship with the Jawaharlal Nehru Technological University, Hyderabad?**
We remain an affiliated college of the Jawaharlal Nehru Technological University, Hyderabad. The University has the right to nominate its members on the academic bodies of the college.
- 21. Shall we require University approval if we want to start any New Courses?**
Yes, It is expected that approvals or such other matters from an autonomous college will receive priority.
- 22. Shall we get autonomy for PG and Doctoral Programmes also?**
Yes, presently our 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.