

**ACADEMIC REGULATIONS  
COURSE STRUCTURE  
AND  
DETAILED SYLLABI**

**For  
MASTER OF TECHNOLOGY  
in  
Computer Networks & Information Security**  
*(For the batches admitted from 2016-2017)*

**CHOICE BASED CREDIT SYSTEM**



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
SREE VIDYANIKETHAN ENGINEERING COLLEGE**

**(AUTONOMOUS)**

**(Affiliated to JNTUA Ananthapuramu, Approved by AICTE  
Programs Accredited by NBA; NAAC with 'A' grade)  
Sree Sainath Nagar, A.Rangampet, Near Tirupati - 517 102 A.P**

## **VISION**

To be one of the Nation's premier Engineering Colleges by achieving the highest order of excellence in Teaching and Research.

## **MISSION**

- To foster intellectual curiosity, pursuit and dissemination of knowledge.
- To explore students' potential through academic freedom and integrity.
- To promote technical mastery and nurture skilled professionals to face competition in ever increasing complex world.

## **QUALITY POLICY**

Sree Vidyanikethan Engineering College strives to establish a system of Quality Assurance to continuously address, monitor and evaluate the quality of education offered to students, thus promoting effective teaching processes for the benefit of students and making the College a Centre of Excellence for Engineering and Technological studies.

**VISION:**

To become a center of excellence in Computer Science and Engineering by imparting high quality education through teaching, training and research

**MISSION:**

1. The Department of Computer Science and Engineering is established to provide undergraduate and graduate education in the field of Computer Science and Engineering to students with diverse background in foundations of software and hardware through a broad curriculum and strongly focused on developing advanced knowledge to become future leaders.
2. Create knowledge of advanced concepts, innovative technologies and develop research aptitude for contributing to the needs of industry and society.
3. Develop professional and soft skills for improved knowledge and employability of students.
4. Encourage students to engage in life-long learning to create awareness of the contemporary developments in computer science and engineering to become outstanding professionals.
5. Develop attitude for ethical and social responsibilities in professional practice at regional, National and International levels

**Program Educational Objectives (PEOs):**

*Within few years of graduation, M.Tech (CNIS) program graduates will be:*

1. Pursuing advanced studies in the areas of Computer Networks, Network Security, Cloud Computing and related disciplines.
2. Employed in reputed computer, IT, Government and Research organizations or be able to establish startup companies.
3. Able to achieve professional advancement through continuing education, demonstrate effective communication, increased responsibility, leadership skills, team work and ethical code of conduct.

**Program Outcomes (POs)**

*After successful completion of M.Tech (CNIS) program, graduates will be able to:*

1. Acquire in-depth knowledge of specific discipline or professional area, including wider and global perspective, with an ability to discriminate, evaluate, analyze and synthesize existing and new knowledge, and integration of the same for enhancement of knowledge (**Scholarship of Knowledge**).

2. Analyze complex engineering problems critically; apply independent judgment for synthesizing information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context (**critical Thinking**).
3. Think laterally and originally, conceptualize and solve engineering problems, evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health and safety, cultural, societal and environmental factors in the core areas of expertise (**Problem Solving**).
4. Extract information pertinent to unfamiliar problems through literature survey and experiments, apply appropriate research methodologies, techniques and tools, design, conduct experiments, analyze and interpret data, demonstrate higher order skill and view things in a broader perspective, contribute individually/in group(s) to the development of scientific/technological knowledge in one or more domains of engineering (**Research Skill**).
5. Create, select, learn and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering activities with an understanding of the limitations (**Usage of modern tools**).
6. Possess knowledge and understanding of group dynamics, recognize opportunities and contribute positively to collaborative-multidisciplinary scientific research, demonstrate a capacity for self-management and teamwork, decision-making based on open-mindedness, objectivity and rational analysis in order to achieve common goals and further the learning of themselves as well as others (**Collaborative and Multidisciplinary work**).
7. Demonstrate knowledge and understanding of engineering and management principles and apply the same to one's own work, as a member and leader in a team, manage projects efficiently in respective disciplines and multidisciplinary environments after consideration of economical and financial factors (**Project Management and Finance**).
8. Communicate with the engineering community, and with society at large, regarding complex engineering activities confidently and effectively, such as, being able to comprehend and write effective reports and design documentation by adhering to appropriate standards, make effective presentations, and give and receive clear instructions (**communication**).
9. Recognize the need for, and have the preparation and ability to engage in life-long learning independently, with a high level

- of enthusiasm and commitment to improve knowledge and competence continuously (**Lifelong Learning**).
10. Acquire professional and intellectual integrity, professional code of conduct, ethics of research and scholarship, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society (**Ethical Practices and Social Responsibility**).
  11. Observe and examine critically the outcomes of one's actions and make corrective measures subsequently, and learn from mistakes without depending on external feedback (**Independent and Reflective Learning**).

**Program Specific Outcomes (PSOs):**

*After successful completion of the program, graduates of M.Tech (CNIS) will:*

1. Demonstrate advanced knowledge of Wired and Wireless Networks, Network Security, Ethical Hacking, Cyber Laws and Network Protocols.
2. Analyze and Develop solutions for complex problems in computer Networks and Information security domain
3. Design, implement, test and evaluate computer networks, identify and trace back security attacks in Networks using modern techniques and tools.
4. Apply advanced knowledge to identify research challenges, and contribute individually or in teams to the development of Computer Networks and Information security domain.

**ACADEMIC REGULATIONS  
CHOICE BASED CREDIT SYSTEM**

**M. Tech. Regular Two Year Degree Program**

**(For the batches admitted from the academic year 2016-17)**

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

1. **Applicability:** All the rules specified herein, approved by the Academic Council, shall be in force and applicable to students admitted from the academic year 2016-2017 onwards. Any reference to "College" in these rules and regulations stands for SVEC (Autonomous).
2. **Extent:** All the rules and regulations, specified hereinafter shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. It shall be ratified by Academic Council in the forth coming meeting. As per the requirements of statutory bodies, Principal, SVEC (Autonomous) shall be the Chairman, Academic Council.
3. **Admission:**
  - 3.1. **Admission into the Two Year M. Tech. Degree Program of study in Engineering:**
    - 3.1.1. **Eligibility:**
      - A candidate seeking admission into the two year M. Tech Degree Program should have
        - (i) Passed B.Tech / B.E or equivalent Program recognized by JNTUA, Anantapuramu, for admission as per the guidelines of Andhra Pradesh State Council of Higher Education (APSCHE).
        - (ii) A minimum percentage of marks in the qualifying degree as prescribed by the AICTE / UGC or Government at the time of admission.
        - (iii) Rank / score secured in the PGCET / GATE examination conducted by APSCHE/ MHRD for allotment of a seat by the convener PGCET, for admission.
    - 3.1.2. **Admission Procedure:**

Admissions are made into the two year M.Tech. Degree Program as per the stipulations of APSCHE, Government of Andhra Pradesh:

      - (a) By the Convener, PGCET (for Category-A Seats)
      - (b) By the Management (for Category-B Seats).
4. **Programs of study offered leading to the award of M.Tech. Degree and Eligibility:**

Following are the two year postgraduate degree Programs of study offered in various branches at in SVEC

(Autonomous) leading to the award of M.Tech. degree and eligibility to get admission into the Programs:

<b>Name of the specialization</b>	<b>Offered by the Department</b>	<b>Name of the Degree / Branch eligible for Admission</b>
Electrical Power Systems	EEE	BE/ B.Tech / AMIE in Electrical & Electronics Engineering / Electrical Engineering or equivalent
Digital Electronics and Communication Systems	ECE	BE / B.Tech in ECE / AMIE in ECE, AMIE (Electronics & Telecommunication Engineering) / AMIETE (Electronics & Telematics Engineering)/ Electronics & Computer Engineering/ Electronics/ Electronics & Telematics or equivalent
Communication Systems		
VLSI		
Computer Science	CSE	BE / B.Tech / AMIE in CSE / CSIT / IT / CSSE , M. Sc. (Computer Science), M. Sc. (Information Systems), M. Sc. (Information Technology), MCA or equivalent.
Computer Networks and Information Security		
Software Engineering	IT	

## **5. Duration of the Program:**

### **5.1**

**Minimum Duration:** The program will extend over a period of two years leading to the Degree of Master of Technology (M.Tech) of the JNTUA, Ananthapuramu. The two academic years will be divided into four semesters with two semesters per year. In first year, each semester shall normally consist of 22 weeks ( $\geq 90$  working days) having - 'Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)'. In second year, each semester shall consist of 18

weeks and the entire year is for project work. Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as suggested by UGC, and Curriculum/ Course Structure as suggested by AICTE are followed.

**5.2 Maximum Duration:** The student shall complete all the passing requirements of the M.Tech degree program within a maximum duration of 4 years including Gap year, this duration reckoned from the commencement of the semester to which the student was first admitted to the program.

<b>I SEMESTER (22 weeks)</b>	<b>INSTRUCTION PERIOD:</b> I Spell : 7 Weeks II Spell : 9 Weeks	16 Weeks
	<b>Internal Examinations :</b> I Mid : 1 week II Mid : 1 week	2 Weeks
	Preparation & Practical Examinations	2 Week
	External Examinations	2 Weeks
	Semester Break	2 Weeks
<b>II SEMESTER (22 weeks)</b>	<b>INSTRUCTION PERIOD:</b> I Spell : 7 Weeks II Spell : 9 Weeks	16 weeks
	<b>Internal Examinations :</b> I Mid : 1 week II Mid : 1 week	2 Weeks
	Preparation & Practical Examinations	2 Week
	External Examinations	2 Weeks
	Summer Vacation	4 Weeks
<b>III SEMESTER</b>	Project Work Phase – I	19 Weeks
<b>IV SEMESTER</b>	Project Work Phase – II	19 Weeks
	Project Work Viva-Voce examinations	2 Weeks

- 6. Course Structure:** Each Program of study shall consist of:
- Professional core courses:  
The list of professional core courses are chosen as per the suggestions of the experts, to impart knowledge and skills needed in the concerned specialization of study.
  - Professional elective courses:  
Professional elective courses shall be offered to the students to diversify their spectrum of knowledge and skills. The elective courses can be chosen based on the interest of the student to broaden his individual knowledge and skills.
  - Audit Courses: Audit courses shall be offered to the students to diversify their knowledge.



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

7. **Credit System:** All Courses are to be registered by a student in a Semester to earn Credits. Credits are assigned based on the following norms given in Table 1.

**Table 1**

<b>Course</b>	<b>Periods/Week</b>	<b>Credits</b>
Theory	01	01
Practical	04	02
Seminar	--	02
Project Work Phase-I	--	--
Project Work Phase-II	--	28

- i. As a norm, for the theory courses, **one credit** for one contact period per week is assigned.
- ii. As a norm, for practical courses **two credits** will be assigned for four contact periods per week.
- iii. For courses like Project/Seminar, where formal contact periods are not specified, credits are assigned based on the complexity of the work to be carried out.
- iv. There are no credits for audit courses.

Other student activities like NCC, NSS, Sports, Study Tour, Guest Lecture etc. will not carry Credits.

The two year curriculum of any M. Tech Degree Program of study shall have total of **86** credits (28 credits in I Semester, 30 credits in II Semester and 28 credits in IV Semester).

**8. Choice Based Credit System (CBCS):**

Choice Based Credit System (CBCS) is introduced based on UGC guidelines in order to promote:

- Student centered learning
- Cafeteria approach
- Students to learn courses of their choice
- Learning at their own pace
- Interdisciplinary learning
- A student is introduced to "Choice Based Credit System (CBCS)"
- The total credits for the Program is 86.
- A student has choice of registering for credits from the theory courses offered in the program ensuring the total credits in a semester are between 24 and 34.
- In I Semester, the student has the option of registering for one additional theory course from the latter semester or dropping one existing theory course from the current semester within the course structure of the program. In II Semester also, the student has the option of registering for one additional theory course from the previous semester if dropped

earlier within the course structure of the program. However the maximum number of credits the student can register in a particular semester cannot exceed 33 credits.

- Grade points, based on percentage of marks awarded for each course will form the basis for calculation of SGPA (Semester Grade Point Average) and CGPA (Cumulative Grade Point Average).
- All the registered credits will be considered for the calculation of final CGPA.

## **9. Course Enrollment and Registration**

**9.1** Each student, on admission shall be assigned to a Faculty Advisor (Mentor) who shall advise and counsel the student about the details of the academic program and the choice of courses considering the student's academic background and career objectives.

**9.2** The enrollment of courses in I Semester will commence on the day of admission. If the student wishes, the student may drop or add courses (vide clause 8) within **three** days before commencement of I semester class work and complete the registration process. The student shall enroll for the courses with the help of the student's Faculty Advisor (Mentor). The enrollment of courses in II Semester will commence 10 days prior to the last instructional day of the I semester and complete the registration process for all the remaining theory courses as per program course structure, duly authorized by the Chairman, Board of studies of concern department.

**9.3** If any student fails to register the courses in a semester, he shall undergo the courses as per the program structure.

**9.4** After registering for a course, a student shall attend the classes, satisfy the attendance requirements, earn Continuous Assessment marks and appear for the Semester-end Examinations.

**9.5** No elective course shall be offered by a Department unless a minimum of 8 students register for the course.

## **10. Massive Open Online Course (MOOC)**

A Massive Open Online Course (MOOC) is an online course aimed at unlimited participation and open access via the web. MOOC is a model for delivering learning content online to any person who takes a course, with no limit on attendance.

- A student shall undergo a "Massive Open Online Course (MOOC)" for award of the degree besides other requirements.
- A student is offered this Online Course at the beginning of his II Semester of study and the course has to be completed by the end of III Semester. If the student fails to complete the course by the end of III Semester, it shall be treated as a backlog and needs to be completed before completion of the program for the award of the degree.

- The student shall confirm registration by enrolling the course within 10 days prior to the last instructional day of the I semester like other courses.
- The courses will be approved by the Chairman, Academic Council, SVEC based on the recommendations of the Chairman, Board of Studies of concerned program considering current needs.
- A student has a choice of registering for only one MOOC with the recommendation of Chairman, Board of studies of concerned program and duly approved by the Chairman, Academic Council, SVEC.
- The student shall undergo MOOC without disturbing the normal schedule of regular class work.
- One faculty member assigned by the Head of the Department shall be responsible for the periodic monitoring of the course implementation.
- No formal lectures need be delivered by the faculty member assigned to the students.
- If any student wants to change the MOOC course already registered, he will be given choice to register a new MOOC course in M. Tech. II / III Semester only, with the recommendation of Chairman, Board of studies of concerned program and duly approved by the Chairman, Academic Council, SVEC.
- Finally, the performance of the student in the course will be evaluated as stipulated by the course provider. A certificate will be issued on successful completion of the course by the course provider.
- The performance in the MOOC will not be considered for the calculation of SGPA and CGPA of the student.
- The MOOC course will be listed in the grade sheets of the student.

### **11. Break of Study from a Program (Gap Year)**

- 11.1** A student is permitted to go on break of study for a maximum period of one year.
- 11.2** The student shall apply for break of study in advance, in any case, not later than the last date of the first assessment period in a semester. The application downloaded from website and duly filled by the student shall be submitted to the Head of the Department. In the case of start-up for incubation of idea only, the application for break of study shall be forwarded by the Head of the Department to the Principal, SVEC. A sub-committee appointed by the principal shall give recommendations for approval.
- 11.3** The students permitted to rejoin the program after break of study shall be governed by the Curriculum and Regulations in force at the time of rejoining. The students rejoining in new regulations shall apply to the Principal, SVEC in the prescribed format through Head of the Department at the beginning of the readmitted semester itself for prescribing

additional/equivalent courses, if any, from any semester of the regulations in-force, so as to bridge the curriculum in-force and the old curriculum.

**11.4** The total period for completion of the program reckoned from the commencement of the I Semester to which the student was admitted shall not exceed the maximum period specified in clause 5.2 irrespective of the period of break of study in order that the student may be eligible for the award of the degree (vide clause 19).

**11.5** If a student has not reported to the department after approved period of break of study without any intimation, the student is treated as detained in that semester. Such students are eligible for readmission for the semester when offered next.

**12. Examination System:** All components in any Program of study shall be evaluated through internal evaluation and / or an external evaluation conducted as semester-end examination.

**12.1. Distribution of Marks:**

Sl. No.	Course	Marks	Examination and Evaluation	Scheme of examination
1.	Theory	60	Semester-end examination of 3 hours duration (External evaluation)	The examination question paper in theory courses shall be for a maximum of 60 marks. The question paper shall be of descriptive type with 5 questions, taken one from each unit of syllabus, having internal choice and all 5 questions shall be answered. All questions carry equal marks.
		40	Mid-term Examination of 2 hours duration (Internal evaluation).	The question paper shall be of descriptive type with 5 essay type questions out of which 4 are to be answered and evaluated for 40 marks.

Sl. No.	Course	Marks	Examination and Evaluation	Scheme of examination	
				<p>Two mid-term examinations each for 40 marks are to be conducted. For a total of 40 marks, 75% of better one of the two and 25% of the other one are added and finalized.</p> <p><b>Mid-I:</b> After first spell of instruction (I to II Units).</p> <p><b>Mid-II:</b> After second spell of instruction (III to V Units).</p>	
2	Laboratory	50	Semester-end Lab Examination for 3 hours duration (External evaluation)	50 marks are allotted for laboratory examination during semester-end.	
		50	30	Day-to-Day evaluation for Performance in laboratory experiments and Record. (Internal evaluation).	Two laboratory examinations, which includes Day-to-Day evaluation and Practical test, each for 50 marks are to be evaluated. For a total of 50 marks 75% of better one of the two and 25% of the other one are added and finalized.
			20	Practical test (Internal evaluation).	

Sl. No.	Course	Marks	Examination and Evaluation		Scheme of examination
					<b>Laboratory examination-II:</b> Shall be conducted just before II mid-term examinations.
3	Audit Course	-	-		Audit course will be conducted as given in 12.2.1
4	Seminar	100	Semester-end Examination		100 marks are allotted for Seminar during semester-end evaluation by the Departmental Committee (DC) as given in 12.2.2.
5	Project Work	400	200	External evaluation	Semester-end Project Viva-Voce Examination by Committee as detailed in 12.2.3.
			200	Internal evaluation	Continuous evaluation by the DC as detailed in 12.2.3. In each of Phase-I and Phase-II, 75% marks of better one of the two oral presentations and 25% marks of the other one are added and internal marks finalized.

## 12.2 Audit Course/Seminar/Project Work Evaluation:

**12.2.1. Audit Course:** For audit course, attendance shall be maintained like in case of any regular course. Students may be encouraged to submit assignments and give presentations on the course topics. There won't be any examinations for audit courses. However, the courses shall be listed in the grade sheet of the student.

**12.2.2. Seminar:** For the seminar, the student shall collect information through literature survey on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the Department a week before presentation. The report and the presentation shall be evaluated at the end of the semester during the period of preparation and practicals by the Departmental Committee (DC) consisting of two senior faculty members and concerned supervisor of the department. The DC is constituted by the Principal on the recommendations of the Head of the Department. The department shall have individual DCs for each M. Tech. Program with senior faculty members and the supervisor specialized in the program.

**12.2.3. Project Work:**

**12.2.3.1.** Student shall register for the Project work with the approval of DC in the III Semester and continue the work in the IV Semester too. The DC shall monitor the progress of the project work. In III Semester, Phase-I of the Project Work has 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 DC for evaluation and award of internal marks. At the end of Phase -I, the Viva-Voce examination shall be conducted as per the III Semester examinations schedule by a committee consisting of HOD, Supervisor and a senior faculty member specialized in the program other than the two senior faculty members of the DC. The senior faculty member will be nominated by the Chief Controller of the Examinations from the panel of three members submitted by the Department for all the students of the specialization. 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 DC. 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 based on the progress, presentations and quality of work. A candidate shall be allowed to submit the dissertation only after passing all the courses from 1<sup>st</sup> to 3<sup>rd</sup> semesters and on

recommendations of the DC. The Viva-Voce examination shall be conducted as per the IV Semester examinations schedule.

- 12.2.3.2** Three copies of the dissertation certified in the prescribed form by the concerned Supervisor and HOD shall be submitted to the Department. One copy is to be submitted to the Chief Controller of Examinations, SVEC (Autonomous) and one copy to be sent to the examiner. The examiner shall be nominated by the Chief Controller of the Examinations from the panel of three examiners submitted by the Department for a maximum of 5 students at a time for adjudication.
- 12.2.3.3** If the report of the examiner is favourable, Viva-Voce examination shall be conducted by a board consisting of the concerned Supervisor, Head of the Department and the examiner who adjudicated the dissertation. The board shall jointly evaluate the candidates project work. If the report of the examiner is not favourable, the candidate should revise and resubmit the project report followed by Viva-Voce examination.
- 12.2.3.4** The candidates who fail in Viva-Voce examination shall have to re-appear the Viva-Voce examination after three months. Extension of time within the total permissible limit for completing the project is to be obtained from the Chairman, Academic Council, SVEC (Autonomous).
- 12.2.3.5** If a candidate desires to change the topic of the project already chosen, during Phase-II, he has to re-register for Project work with the approval of the DC and repeat Phases-I & II. Marks already earned in Phase-I stand cancelled.
- 12.2.3.6** If a candidate unable to complete the project work after Phase-II and desires to change the topic of the project already chosen, he has to re-register for Project work with the approval of the DC and repeat Phases-I & II. Marks already earned in Phase-I & II stand cancelled.
- 12.3. Eligibility to appear for the semester-end examination:**
- 12.3.1** 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 courses in a semester.
- 12.3.2** Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.



- 12.3.3** Shortage of attendance below 65% in aggregate shall in no case be condoned.
- 12.3.4** Students whose shortage of attendance is not condoned in any semester shall not be eligible to take their semester-end examination and their registration shall stand cancelled.
- 12.3.5** A student shall not be promoted to the next semester unless he satisfies the attendance requirements of the semester, as applicable. The student may seek readmission for the semester when offered next. He will not be allowed to register for the courses of the semester while he is in detention.
- 12.3.6** A stipulated fee shall be payable to the college towards condonation of shortage of attendance.
- 12.4. Evaluation:** Following procedure governs the evaluation.
- 12.4.1.** 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 shall be added to the external evaluation marks secured in the semester-end examinations, to arrive at total marks for any course in that semester.
- 12.4.2.** Performance in all the courses is tabulated course-wise and shall be scrutinized by the Results Committee and moderation is applied if needed, and course-wise marks are finalized. Total marks obtained in each course are converted into letter grades.
- 12.4.3.** Student-wise tabulation shall be done and individual grade sheet shall be generated and issued.
- 12.5. Personal verification / Revaluation / Recounting:** Students shall be permitted for personal verification/request for recounting/ revaluation of the semester-end examination answer scripts within a stipulated period after payment of prescribed fee. After recounting or revaluation, records shall be updated with changes if any and the student shall be issued a revised grade sheet. If there are no changes, the student shall be intimated the same through a notice.
- 12.6. Supplementary Examination:** In addition to the regular semester-end examinations conducted, the College may also schedule and conduct supplementary examinations for all the courses of other semesters when feasible for the benefit of students. Such of the candidates writing supplementary

examinations may have to write more than one examination per day.

**13. Re-Registration for Improvement of Internal Marks:**

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

**13.1** The candidate should have completed the course work and obtained examinations results for I and II semesters.

**13.2** Out of the courses the candidate has failed in the examinations due to internal evaluation marks secured being less than 50%, the candidate shall be given one chance for a maximum of 3 theory courses for improvement of internal evaluation marks.

**13.3** He should have passed all the remaining courses for which the internal evaluation marks secured more than or equal to 50%.

**13.4** The candidate has to register for the chosen courses and fulfill the academic requirements.

**13.5** For each course, 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./Challan in favor of the Principal, Sree Vidyanikethan Engineering College payable at Tirupati along with the requisition through the concerned Head of the Department.

**13.6** In the event of availing the Improvement of Internal evaluation marks, the internal evaluation marks as well as the semester-end examinations marks secured in the previous attempt(s) for the re-registered courses stand cancelled.

**14. Academic Requirements for completion of M.Tech Program of study:**

The following academic requirements have to be satisfied in addition to the attendance requirements for completion of M.Tech Program of study.

**14.1** A student shall be deemed to have satisfied the minimum academic requirements for each theory, laboratory and project work, if he secures not less than 40% of marks in the semester-end examination and a minimum of 50% of marks in the sum total of the internal evaluation and semester-end examination taken together. For the seminar, he should secure not less than 50% of marks in the semester-end examination.

**14.2** A student shall register for all the 86credits and earn all the 86 credits. Marks obtained in the 86credits shall be

considered for the calculation of the DIVISION based on CGPA.

- 14.3 A student who fails to earn 86credits as indicated in the curriculum within **four** academic years from the year of his admission shall forfeit his seat in M.Tech. Program and his admission stands cancelled.

**15. Transitory Regulations:**

Students who got detained for want of attendance (**or**) who have not fulfilled academic requirements (**or**) who have failed after having undergone the Program in earlier regulations (**or**) who have discontinued and wish to continue the Program are eligible for admission into the unfinished semester from the date of commencement of class work with the same (**or**) equivalent courses as and when courses are offered and they will be in the academic regulations into which they are presently 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. Grades, Grade Point Average and Cumulative Grade Point Average:**

- 16.1. Grade System:** After all the components and sub-components of any course (including laboratory courses) are evaluated, the final total marks obtained shall be converted to letter grades on a "**10 point scale**" as described below.

**Grades conversion and Grade points allotted**

<b>% of Marks obtained</b>	<b>Grade</b>	<b>Description of Grade</b>	<b>Grade Points (GP)</b>
≥ 95	O	Outstanding	10
≥ 85 to < 95	S	Superior	9
≥ 75 to < 85	A	Excellent	8
≥ 65 to < 75	B	Very Good	7
≥ 55 to < 65	C	Good	6
≥ 50 to < 55	D	Pass	5
< 50	F	Fail	0
Not Appeared	N	Absent	0

**Pass Marks:** A student shall be declared to have passed theory course, laboratory course and project work if he secures minimum of 40% marks in Semester-end examination, and a minimum of 50% marks in the sum total of internal evaluation and Semester-end examination taken together. For the seminar, he shall be declared to have passed if he secures minimum of 50% of marks in the semester-end examinations. Otherwise he shall be awarded fail grade - **F** in

such a course irrespective of internal marks. **F** is considered as a fail grade indicating that the student has to pass the semester-end examination in that course in future and obtain a grade other than **F** and **N** for passing the course.

**16.2. Semester Grade Point Average (SGPA):**

Semester Grade Point Average (SGPA) shall be calculated as given below on a "10 point scale" as an index of the student's performance at the end of each semester:

$$SGPA = \frac{\sum(C \times GP)}{\sum C}$$

where **C** denotes the credits assigned to the courses undertaken in that semester and **GP** denotes the grade points earned by the student in the respective courses.

**Note:** SGPA is calculated only for the candidates who passed all the courses in that semester.

**16.3. Cumulative Grade Point Average (CGPA):**

The CGPA for any student is awarded only when he completes the Program i.e., when the student passes in all the courses prescribed in the Program. The CGPA is computed on a 10 point scale as given below:

$$CGPA = \frac{\sum(C \times GP)}{\sum C}$$

where **C** denotes the credits assigned to courses undertaken up to the end of the Program and **GP** denotes the grade points earned by the student in the respective courses.

**17. Grade Sheet:** A grade sheet (Marks Memorandum) shall be issued to each student indicating his performance in all courses registered in that semester indicating the SGPA.

**18. Transcripts:** After successful completion of the entire Program of study, a transcript containing performance in all academic years shall be issued as a final record. Duplicate 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.

**19. Award of Degree:** The Degree shall be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Ananthapuramu on the recommendations of the Chairman, Academic Council, SVEC (Autonomous).

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

- Registered and successfully completed all the components prescribed in the Program of study to which he is admitted.

- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the Program of study within the stipulated time.
- Obtained CGPA greater than or equal to 5.0 (Minimum requirement for declaring as passed).
- Has no dues to the College, Hostel, Library etc. and to any other amenities provided by the College.
- No disciplinary action is pending against him.

**19.2. Award of Division:** Declaration of division is based on CGPA.

#### **Awarding of Division**

<b>CGPA</b>	<b>Division</b>
> = 7.0	First Class with Distinction
> = 6.0 and < 7.0	First Class
> = 5.0 and < 6.0	Second Class

**20. Additional academic regulations:**

20.1 A student may appear for any number of supplementary examinations within the stipulated time to fulfill regulatory requirements for award of the degree.

20.2 In case of malpractice/improper conduct during the examinations, guidelines shall be followed as shown in the **Annexure-I**.

20.3 When a student is absent for any examination (Mid-term or Semester-end) he shall be awarded **zero** marks in that component (course) and grading will be done accordingly.

20.4 When a component is cancelled as a penalty, he shall be awarded zero marks in that component.

**21. Withholding of Results:**

If the candidate has not paid dues to the College/University (or) if any case of indiscipline is pending against him, the result of the candidate shall be withheld and he will not be allowed/promoted to the next higher semester

**22. Amendments to regulations:**

The Academic Council of SVEC (Autonomous) 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., with the recommendations of the concerned Board(s) of Studies.

**23. General:**

The words such as "he", "him", "his" and "himself" shall be understood to include all students irrespective of gender connotation.

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

**Annexure-I**  
**GUIDE LINES FOR DISCIPLINARY ACTION FOR**  
**MALPRACTICES/IMPROPER CONDUCT IN EXAMINATIONS**

Rule No.	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 course 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 course of the examination)	Expulsion from the examination hall and cancellation of the performance in that course 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 course 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 course of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the courses of that Semester. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred for four consecutive semesters from class work and all Semester-end examinations. The continuation of the course

		<p>by the candidate is subject to the academic regulations in connection with forfeiture of seat.</p> <p>The performance of the original candidate who has been impersonated, shall be cancelled in all the courses of the examination (including labs and project work) already appeared and shall not be allowed to appear for examinations of the remaining courses of that semester. The candidate is also debarred for four consecutive semesters from class work and all Semester-end examinations, if his involvement is established. Otherwise, The candidate is debarred for two consecutive semesters from class work and all Semester-end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.</p> <p>If the imposter is an outsider, he will be handed over to the police and a case is registered against him.</p>
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 course and all the other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester. The candidate is also debarred for two consecutive semesters from class work and all Semester-

		end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	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 course only.
6.	Refuses to obey the orders of the Chief Controller of Examinations/ Controller of Examinations/any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the Controller of Examinations or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the Controller of Examinations, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that course and all other courses the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the courses of that semester. If the candidate physically assaults the invigilator/Controller of the Examinations, then the candidate is also debarred and forfeits his/her seat. 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 course and all the other courses the candidate has already appeared including



		practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester. The candidate is also debarred for two consecutive semesters from class work and all Semester-end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester. The candidate is also debarred and forfeits the seat.

**Note:** Whenever the performance of a student is cancelled in any course(s) due to Malpractice, he has to register for Semester-end Examinations in that course(s) consequently and has to fulfill all the norms required for the award of Degree.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**SVEC-16 - M. Tech (Computer Networks & Information Security)**  
**Course Structure**  
**I-Semester**

Course Code	Course Title	Contact Periods per Week				Credits	Scheme of Examination Max. Marks		
		L	T	P	Total		Int. Marks	Ext. Marks	Total Marks
16MT10501	Advanced Computer Networks	4	-	-	4	4	40	60	100
16MT10504	Data Warehousing and Data Mining	4	-	-	4	4	40	60	100
16MT20505	Information Security	4	-	-	4	4	40	60	100
16MT20506	Mobile Computing	4	-	-	4	4	40	60	100
16MT22505	Web Technologies	4	-	-	4	4	40	60	100
	<b>Professional Elective-1</b>								
16MT16301	Design of Secure Protocols	4	-	-	4	4	40	60	100
16MT16302	Ethical Hacking								
16MT10507	Internet of Things								
16MT22508	Software Security								
16MT16331	Computer Networks & Information Security Lab	-	-	4	4	2	50	50	100
16MT16332	Web Technologies Lab	-	-	4	4	2	50	50	100
<b>Total:</b>		<b>24</b>	<b>-</b>	<b>8</b>	<b>32</b>	<b>28</b>	<b>340</b>	<b>460</b>	<b>800</b>
16MT13808	Research Methodology (Audit Course)	-	2	-	2	-	-	-	-

## II-Semester

Course Code	Course Title	Contact Periods per Week				Credits	Scheme of Examination Max. Marks		
		L	T	P	Total		Int. Marks	Ext. Marks	Total Marks
16MT20502	Big Data Analytics	4	-	-	4	4	40	60	100
16MT12501	Cloud Computing	4	-	-	4	4	40	60	100
16MT26301	Intrusion Detection Systems	4	-	-	4	4	40	60	100
16MT26302	Network Programming	4	-	-	4	4	40	60	100
16MT26303	Wireless Networks	4	-	-	4	4	40	60	100
	<b>Professional Elective-2</b>								
16MT10506	Information Retrieval Systems	4	-	-	4	4	40	60	100
16MT26304	Computer Forensics								
16MT26305	Database Security								
16MT26306	Social Networks								
16MT20531	Cloud Computing & Big Data Analytics Lab	-	-	4	4	2	50	50	100
16MT26331	Wireless Networks Lab	-	-	4	4	2	50	50	100
16MT26332	Seminar	-	-	-	-	2	--	100	100
<b>Total:</b>		<b>24</b>	<b>-</b>	<b>8</b>	<b>32</b>	<b>30</b>	<b>340</b>	<b>560</b>	<b>900</b>
16MT23810	Intellectual property Rights	-	2	-	2	-	-	-	-

## III-Semester

S. No.	Course Code	Course Title	Contact Periods per Week				Credits	Scheme of Examination Max. Marks		
			L	T	P*	Total		Int. Marks	Ext. Marks	Total Marks
1.	16MT3MOOC	MOOC	-	-	-	-	-	-	-	
2.	16MT36331	Project Work Phase I	-	-	-	-	8	50	50	100
<b>Total:</b>			<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8</b>	<b>50</b>	<b>50</b>	<b>100</b>

\*Fulltime Project Work

## IV-Semester

S. No.	Course Code	Course Title	Contact Periods per Week				Credits	Scheme of Examination Max. Marks		
			L	T	P*	Total		Int. Marks	Ext. Marks	Total Marks
1.	16MT46331	Project Work Phase II	-	-	-	-	20	150	150	300
<b>Total:</b>			<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>20</b>	<b>150</b>	<b>150</b>	<b>300</b>
<b>Grand Total:</b>							<b>86</b>	<b>880</b>	<b>1220</b>	<b>2100</b>

\*Fulltime Project Work

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M. Tech. (CN&IS) I-Semester**  
**(16MT10501) ADVANCED COMPUTER NETWORKS**  
**(Common to CS and CN&IS)**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>--</b>	<b>--</b>	<b>4</b>

**PRE-REQUISITES:**

A Course on "Computer Networks"

**COURSE DESCRIPTION:**

Computer Networks and Protocols; Data Link Layer, LAN and Network routing; Transport Layer and Internet Protocols; Wireless and Optical Networks; MANETs and Wireless Sensor Networks

**COURSE OUTCOMES:**

*After successful completion of this course, students will be able to:*

- CO1. Gain knowledge on principles of computers, network topologies, routing mechanisms.
- CO2. Analyze the computer network with suitable network protocols and routing algorithms.
- CO3. Formulate solutions for engineering problems pertaining to the advanced networking technologies.
- CO4. Develop new techniques for subnet masks and addresses to fulfill networking requirements.
- CO5. Conduct research to solve the problems related to routing algorithms in Network applications.

**DETAILED SYLLABUS:**

**UNIT I – REVIEW OF COMPUTER NETWORKS AND FOUNDATION OF NETWORKING PROTOCOLS (11 periods)**

Review of Computer Networks and the Internet-The Network edge, The Network core, Access Networks and Physical media, ISPs and Internet Backbones, Delay and Loss in Packet, Packet-Switched Networks.

Foundations of Networking Protocols-5-layer TCP/IP Model, 7-Layer OSI Model, Internet Protocols and Addressing, Equal-Sized Packets Model: ATM.

**UNIT II – DATA LINKS, TRANSMISSION AND ROUTING**

**(11 periods)**

The Link Layer and Local Area Networks-Link Layer Introduction and Services, Error-Detection and Error-Correction Techniques, Multiple Access Protocols, Link Layer Addressing.

Routing and Internet Working-Network Layer Routing, Least-Cost-Path algorithms, Non-Least-Cost-Path Algorithms, Intradomain Routing Protocols, Interdomain Routing Protocols

**UNIT III – TRANSPORT LAYER PROTOCOLS AND NETWORK APPLICATIONS (11 periods)**

Transport and End-to-End Protocols-Transport Layer, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), TCP Congestion Control.

Application Layer-Principles of Network Applications, The Web and HTTP, File Transfer: FTP, Electronic Mail in the Internet, Domain Name System (DNS).

**UNIT IV – WIRELESS NETWORKS AND OPTICAL NETWORKS (11 periods)**

Wireless Networks and Mobile IP-Infrastructure of Wireless Networks, Wireless LAN Technologies, IEEE 802.11 Wireless Standards, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs).

Optical Networks and WDM Systems-Overview of Optical Networks, Basic Optical Networking Devices, Large-Scale Optical Switches, Optical Routers

**UNIT V – MANETS AND WIRELESS SENSOR NETWORKS (11 periods)**

Mobile Ad-Hoc Networks-Overview of Wireless Ad-Hoc Networks, Routing in Ad-Hoc Networks, Routing Protocols for Ad-Hoc Networks-DSDV, DSR, CGSR and AODV

Wireless Sensor Networks-Sensor Networks and Protocol Structures, Communication Energy Model, Clustering Protocols, Routing Protocols

**Total Periods: 55**

**TEXT BOOKS:**

1. Nader F. Mir, *“Computer and Communication Networks,”* Pearson Education, 2007.
2. F. Kurose, Keith W. Ross, *“Computer Networking: A Top-Down Approach Featuring the Internet,”* 3ed, Pearson Education, 2007.

**REFERENCE BOOKS:**

1. Behrouz A. Forouzan, *“Data Communications and Networking,”* 4ed, Tata McGraw Hill, 2007
2. Andrew S. Tanenbaum, *“Computer Networks,”* 4ed, Pearson Education, New Delhi, 1997.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M. Tech (CN&IS)I-Semester**  
**(16MT10504) DATA WAREHOUSING AND DATA MINING**  
**(Common to CS and CN&IS)**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	-	--	4

**PRE-REQUISITES:**

*A course on "Database Management Systems"*

**COURSE DESCRIPTION**

Concepts of Data Warehousing and Data Mining; Pre-processing Techniques in Data Warehouses; Data cube computation and OLAP query processing; Data Mining process and System architecture; relationship with data warehouse and OLAP Systems; Data mining Techniques and Applications

**COURSE OUTCOMES:**

*After successful completion of this course, students will be able to:*

CO1. Gain knowledge in:

- Multidimensional data model and Data Warehouse architectures. .
- Data mining algorithms.
- Association Rules, Classification and Prediction and Cluster Analysis.

CO2. Analyse data mining algorithms for complex industrial problems.

CO3. Solve engineering problems to get wide variety of solutions by applying data mining algorithms.

CO4. Ability to carry out research in spatial mining, spatio temporal mining, text mining, multimedia and web mining

CO5. Create and apply appropriate techniques & tools of data mining to solve real world problems

**DETAILED SYLLABUS:**

**UNIT I – INTRODUCTION TO DATA WAREHOUSE AND DATA MINING**

**(10 periods)**

**Data Warehouse-** A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehouse to Data Mining.

**Data Mining** – Kinds of Data, Data Mining Functionalities, Primitives, Major Issues in Data Mining

**UNIT II – DATA PREPROCESSING, MINING FREQUENT PATTERNS AND ASSOCIATIONS**

**(10 periods)**

**Data Preprocessing-** Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction.

**Mining Frequent Patterns and Associations-** Efficient and Scalable Frequent Item set Mining Methods, Mining various kinds of Association Rules, Constraint based association mining.

### **UNIT III – CLASSIFICATION AND PREDICTION (8 periods)**

Issues regarding classification and prediction, classification by decision tree induction, Bayesian classification, Rule based classification, classification by Back propagation, Prediction, Accuracy and Error Measures.

### **UNIT IV – CLUSTER ANALYSIS (11 periods)**

**Cluster Analysis: Basic Concepts and Algorithms** : introduction to Cluster Analysis, Different Types of Clustering, Different Types of Clusters, K-means, The Basic K-means Algorithm, K-means: Additional Issues, Bisecting K-means, K-means and Different Types of Clusters, Strengths and Weaknesses, K-means as an Optimization Problem, Agglomerative Hierarchical Clustering, Basic Agglomerative Hierarchical Clustering Algorithm, Specific Techniques, DBSCAN, Traditional Density: Center-Based Approach, The DBSCAN Algorithm, Strengths and Weaknesses.

### **UNIT V – MINING STREAM, TIME SERIES, SPATIAL DATA, MULTIMEDIA, TEXT AND WORL WIDE WEB (9 periods)**

Mining Data Streams, Mining Time Series Data, Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

**Total Periods: 48**

#### **TEXT BOOKS:**

1. Jiawei Han and Micheline Kamber, "*Data Mining: Concepts and Techniques*," 2ed, Elsevier, 2009
2. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, "*Introduction to Data Mining*", Pearson Education, 2009.

#### **REFERENCE BOOKS:**

1. Margaret H Dunham, *Data Mining Introductory and Advanced Topics*," 2ed, Pearson Education, 2006
2. Amitesh Sinha, "*Data Warehousing*," PHI Learning, 2007

## **SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

**Department of Computer Science and Engineering**

**I M. Tech (CN&IS) I-Semester**

**(16MT20505) INFORMATION SECURITY**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>--</b>	<b>--</b>	<b>4</b>

### **PRE-REQUISITES:**

*A Course on "Computer Networks"*

### **COURSE DESCRIPTION**

Concepts of cryptographic algorithms, public key and private key encryption, security models, Hash Algorithms, Intrusion Detection, IP Security, analysis of security principles in internet and system security

### **COURSE OUTCOMES:**

After successful completion of this course, students will be able to:

CO1. Gain advanced knowledge in

- Symmetric and Asymmetric Encryption Algorithms
- Key distribution and message Authentication
- Hash algorithms and digital signature techniques
- IP security and Wireless network security
- Intrusion Detection and Firewall configurations

CO2. Analyze the symmetric algorithms, Public-Key Encryption and Hash Algorithms.

CO3. Develop solutions to solve the problems related to Public-Key Encryption, Digital signatures, Secure Hash Functions

CO4. Conduct research to identify efficient ciphers and cryptographic algorithms to provide novel solutions for real time applications

CO5. Apply the appropriate Cryptographic Techniques and security Algorithms in the area of Information Security

### **DETAILED SYLLABUS:**

#### **UNIT-I: INTRODUCTION**

**(10Periods)**

Security Attacks, Security Services, Security Mechanisms, Model for Network Security, Mono alphabetic cipher and Poly alphabetic cipher

**Symmetric Block Encryption-** Symmetric Block Encryption Algorithms-DES, Triple-DES, AES, Cipher Block Modes of Operation

#### **UNIT-II: PUBLIC-KEY ENCRYPTION**

**(10 Periods)**

**Message Authentication-**Approaches to Message Authentication, Simple hash function, Secure Hash Functions -SHA-1, SHA-512, Message Authentication Codes and HMAC

**Public-Key Cryptography-**Public-Key Cryptography Algorithms-RSA, Diffie-Hellman Key Exchange, Digital signature standard

#### **UNIT-III: NETWORK SECURITY APPLICATIONS (12 Periods)**

**Key Distribution and User Authentication-**Kerberos, Key Distribution Using Asymmetric Encryption, X.509 Certificates, Public Key Infrastructure

**Electronic Mail Security-**Pretty Good Privacy, Key Rings, Multipurpose Internet Mail Extensions, S/MIME - Functionality, Messages and certificate processing.



**UNIT-IV: INTERNET SECURITY****(11 Periods)**

**Transport Level Security-** Secure Socket Layer and Transport Layer Security.

**IP Security-** Overview, Policy, Encapsulating Security Payload and IKE.

**Wireless Network security-** IEEE 802.11 Wireless LAN Overview, IEEE 802.11i Wireless LAN Security

**UNIT-V: SYSTEM SECURITY****(10 Periods)**

**Intruders-**Intrusion Detection, Password Management, Malicious Software - Types, Viruses, Virus Countermeasures, Worms.

**Firewalls-** Firewall Characteristics, Firewall Basing, Types of Firewalls, Firewall Location and Configurations.

**Total number of Periods: 53****TEXTBOOKS:**

1. William Stallings, "*Network Security Essentials: Applications and Standards*," 4ed, Pearson Education, New Delhi, 2011
2. Douglas R. Stinson, "*Cryptography - Theory and Practice*," 3ed, CRC Press, 2005

**REFERENCE BOOKS:**

1. William Stallings, "*Cryptography and Network Security*," 5ed, Pearson education, New Delhi, 2011.
2. Eric Maiwald, "*Fundamentals of Network Security*", 1ed, McGraw-Hill, 2003

## **SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

**Department of Computer Science and Engineering**

**I M.Tech (CN&IS) I-Semester**

**(16MT20506) MOBILE COMPUTING**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>--</b>	<b>--</b>	<b>4</b>

### **PRE-REQUISITES:**

A Course on "Computer Networks"

### **COURSE DESCRIPTION:**

GSM architecture, Wireless MAC, and CDMA Systems; Mobile IP network layer; Mobile Transport Layer; Databases, Data dissemination and Broadcasting systems; Synchronization in mobile devices and Mobile Computing Systems; Mobile Application Languages and Mobile Operating Systems.

### **COURSE OUTCOMES:**

*After successful completion of this course, the students will be able to:*

CO1. Gain advanced knowledge in

- GSM and CDMA Systems.
- Mobile IP, and Mobile TCP
- Databases and Data Dissemination
- Mobile Data Synchronization

CO2. Analyze various methods in data dissemination and broadcasting models

CO3. Evaluate and implement novel applications to realize power computing and context-aware computing.

CO4. Contribute positively to multidisciplinary scientific research in design and development of mobile application languages and mobile operating systems for mobile.

CO5. Apply Database hording Techniques, Selective indexing and Tuning techniques to solve mobile computing problems.

### **DETAILED SYLLABUS:**

#### **UNIT I – GSM AND WIRELESS MEDIUM ACCESS CONTROL (11 periods)**

GSM and Similar Architectures: GSM, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services.

Wireless MAC and CDMA – Based Communication: Medium Access control, Introduction to CDMA-based Systems, Spread Spectrum in CDMA Systems, Coding Methods in CDMA.

#### **UNIT II – MOBILE IP NETWORK LAYER AND MOBILE TRANSPORT LAYER**

**(11 periods)**

Mobile IP Network Layer: IP and Mobile IP Network Layer, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, Dynamic Host Configuration Protocol.

Mobile Transport Layer: Conventional Transport Layer Protocols, Indirect TCP, Snooping TCP and Mobile TCP.

**UNIT III – DATABASES AND DATA DISSEMINATION (11 periods)**

Databases: Database Hoarding Techniques, Data Caching, Client-Server Computing and Adaptation.

Data Dissemination and Broadcasting Systems: Communication Asymmetry, Classification of Data-Delivery Mechanisms, Data Dissemination Broadcast Models, Selective Tuning and Indexing Techniques.

**UNIT IV – DATA SYNCHRONIZATION IN MOBILE COMPUTING SYSTEMS AND MOBILE DEVICES (11 periods)**

Data Synchronization in Mobile Computing Systems: Synchronization, Synchronization Software for Mobile Devices, Synchronization Protocols, SynML- Synchronization Language for Mobile Computing, Sync4J (Funambol).

Mobile Devices: Server and Management –Mobile Agent, Application Server, Gateways, Portals, Service Discovery, Device Management, Mobile File Systems, Security.

**UNIT V – MOBILE APPLICATION LANGUAGES AND MOBILE OPERATING SYSTEMS (10 periods)**

Mobile Application Languages: Introduction, XML, JAVA, Java 2 Micro Edition (J2ME), JavaCard.

Mobile Operating Systems: Operating System, Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices.

**Total Periods: 54**

**TEXT BOOK:**

1. Raj Kamal, "Mobile Computing," 2ed ,OXFORD University Press, 2007.

**REFERENCE BOOKS:**

1. Jochen H. Schiller, "Mobile Communications," 2ed, Pearson Education, 2004

2. Ashok K Talukder, Roopa R Yavagal, "Mobile Computing,"2ed, Tata McGraw Hill,2010

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M. Tech (CN&IS) I-Semester**  
**(16MT22505) WEB TECHNOLOGIES**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	-	-	4

**PREREQUISITES:**

A course on "Object Oriented Programming"

**COURSE DESCRIPTION:**

Web Technologies: HTML5, CSS, JavaScript, JQuery; Open source server-side scripting language- PHP; MySQL database concepts; and AJAX

**COURSE OUTCOMES:**

*On successful completion of this course, the students will be able to:*

- CO1. Gain knowledge on web technologies.
- CO2. Analyze the functionality of client as well as server side web technologies for validating web pages.
- CO3. Gain programming skills to design and develop novel web applications
- CO4. Apply web technologies to make web pages more interactive, scalable and user friendly web applications.

**DETAILED SYLLABUS**

**UNIT-I: HTML5 AND CSS3 (Periods: 14)**

**HTML5:** Overview of HTML and XHTML, HTML5 - Introduction, HTML5 Document Structure, Creating Editable Content, Checking Spelling Mistakes, Exploring Custom Data Attributes, Microdata, Client-Side Storage, Drag and Drop Feature, ARIA Accessibility, Offline Web Applications, Web Communications, Cross-Documents Messaging and Desktop Notifications, 2D and 3D Graphics; **CSS3:** Introduction, Features of CSS3, Syntax of CSS, Exploring CSS selectors, Inserting CSS in HTML Document, State of CSS3.

**UNIT-II: JAVASCRIPT AND JQUERY (Periods: 10)**

**JavaScript:** Overview of JavaScript, JavaScript Functions, Events, Image Maps and Animations, JavaScript Objects; **JQuery:** Fundamentals of JQuery, JQuery Selectors, JQuery Methods to Access HTML Attributes and Traversing, JQuery Manipulators, Events and Effects.

**UNIT-III: INTRODUCTION TO PHP (Periods: 10)**

Introduction, Data Types, Variables, Constants, Expressions, String Interpolation, Control Structures, Functions, Arrays, Embedding PHP Code in Web Pages, Object Oriented PHP.

**UNIT–IV: PHP AND MYSQL (Periods:10)**

PHP and Web Forms, Sending Form Data to a Server, Authenticating Users with PHP, Session Handlers, PHP with MySQL, Interacting with the Database, Database Transactions.

**UNIT–V: AJAX (Periods:08)**

Exploring Different Web Technologies, Exploring AJAX, Creating a Sample AJAX Application, Displaying Date and Time using AJAX, Creating the XMLHttpRequest Object, Reading a File Synchronously and Asynchronously, Reading Response Headers, Loading List Boxes Dynamically using XMLHttpRequest Object, JQuery with AJAX, Validating a Field using AJAX and PHP.

**[Total Periods: 52]**

**TEXT BOOKS:**

1. Kogent Learning Solutions Inc, "*HTML 5 Black Book: Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP and JQuery*," 1ed, Dreamtech Press, 2011.
2. W. Jason Gilmore, "*Beginning PHP and MySQL*," 4ed, APress, 2011.

**REFERENCE BOOKS:**

1. Andrea Tarr, "*PHP and MySQL*," 1<sup>st</sup> Edition, Willy India, 2012.
2. Thomas A. Powell, "*The Complete Reference: HTML and CSS*," 5ed, Tata McGraw Hill, 2010.
3. Steve Suehring, Tim Converse and Joyce Park, "*PHP6 and MySQL*," 1ed, Willy India, 2009.
4. P. J. Deitel and H. M. Deitel, "*Internet & World Wide Web How to Program*," 4ed, Pearson, 2009.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**M. Tech (CNIS) I-Semester**  
**(16MT16301) DESIGN OF SECURE PROTOCOLS**  
**(Professional Elective-1)**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	-	-	4

**PRE-REQUISITES:**

A Course on "Cryptography and Network Security, "

**COURSE DESCRIPTION:**

Pseudo-random-Bit generation and algorithm modes; Symmetric and asymmetric cryptography; Authentication protocols and Hash functions; Modern cryptography and its applications, Security implementations over resource constrained networks.

**COURSE OUTCOMES:**

After successful completion of this course, the students will be able to:

- CO1. Gain advanced knowledge on Basic Cryptography Techniques Pseudo-random-Bit generators used in Cryptography.
- CO2. Analyze various Authentication Protocols and security threats of systems against various attacks possible over the Internet services to provide secure access to the system.
- CO3. Solve the security issues by adopting mathematical and logical operators such as hash functions.
- CO4. Carryout research on advanced and modern Cryptographic protocol solutions to resolve security problems in the real world.
- CO5. Evaluate the use of Cryptographic algorithms and tools in providing security to resource constraint networks and e-commerce systems.

**DETAILED SYLLABUS:**

**UNIT-I: BASICS OF CRYPTOGRAPHY (10 Periods)**

**Mathematics for Cryptography:** Modular arithmetic, Finite fields, Primarily testing, Discrete Logarithms and Chinese Remainder theorem

**Pseudo-random-Bit:** Introduction, Random Bit Generation, Pseudo-random-Bit generation, Statistical Tests, Cryptographically Secure Pseudo-random-Bit Generation, Linear Congruential Generators, Linear Feedback Shift Registers, Stream Ciphers Using LFSRs.

**UNIT-II: AUTHENTICATION PROTOCOLS (12 Periods)**

Basic Authentication Techniques, Password based Authentication, The one-time-pad encryption scheme, Authenticated Key Exchange Based on Asymmetric Cryptography, Typical Attacks on Authentication Protocols, SSH, Kerberos Protocol.

**IP SECURITY:** Attacks against naming and addressing in the Internet, Security protocols for address resolution and address auto configuration, Security for global IP mobility, IP Security (IP Sec) protocol.

**UNIT-III: ONE-WAY HASH FUNCTIONS (10 Periods)**

Background, N-Hash, Ripe-MD, Haval, Other One-Way Hash Functions, One-Way Hash Function using Symmetric Block Algorithms, Using Public-Key Algorithms, Choosing a One- Way Hash Functions, Advanced Attacks on Hash Functions, Message Authentication Codes, The birthday attack.

**UNIT-IV: MODERN CRYPTOGRAPHIC APPLICATIONS (13 Periods)**

**Advanced cryptographic protocols:** Selected Classic Ciphers and Cryptanalysis: World War II Ciphers. Selected Modern Ciphers and Cryptanalysis: Smart Card, Cellular and Wireless Communication Ciphers, Zero Knowledge Protocols, Secret Sharing Schemes. Protection in Operating Systems

**E-commerce protocols/schemes:** E-cash, micropayment, blind signature, Electronic voting, electronic auction, payment servers, fair exchange of signatures for contract signing, Data on move and Data on rest in World Wide Web.

**UNIT-V: OVERVIEW OF RESOURCE CONSTRAINT NETWORKS (10 Periods)**

Sensor networks, wireless ad hoc networks, mobile ad hoc networks, radio frequency identification networks; Security issues in resource constraint networks: lightweight cryptography. Tag and ownership transfer protocols, Yoking/grouping protocols, designing integrated security architecture, McCumber Cube model, secure protocols for behavior enforcement, Game theoretic model of packet forwarding

**Total Periods: 55**

**TEXT BOOKS:**

1. Bruce Schneier, "Applied Cryptography," 2ed, Wiley India Pvt. Ltd ,New Delhi:, 2012.
- 2.L. Buttyan, J. P. Hubaux, "Security and Cooperation in Wireless Networks", Cambridge University Press, 2008.

**REFERENCE BOOKS:**

1. Wenbo Mao, "Modern Cryptography - Theory and Practice," 1ed, Pearson Education, New Delhi 2008.
2. James Kempf, "Wireless Internet Security: Architecture and Protocols", Cambridge University Press, 2008.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M. Tech (CN&IS) I-Semester**  
**(16MT16302) ETHICAL HACKING**  
**(Professional Elective – 1)**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>-</b>	<b>--</b>	<b>4</b>

**PRE-REQUISITES:**

*Courses on "Computer networks, Cryptography & Network security"*

**COURSE DESCRIPTION:**

Introduction to hacking concepts; Password hacking Techniques; Denial of service attacks; Web application vulnerabilities; Wireless hacking & physical security; overview of cryptography and penetration testing methodologies.

**COURSE OUTCOMES:**

After successful completion of this course, the students will be able to:

CO1: Gain Knowledge on

- Hacking and its societal issues
- Hacking methods
- Types of hacking
- Tools of hacking

CO2: Analyze system, network vulnerabilities which give a scope to perform hacking.

CO3: Develop skills to solve the different security risks that arise from hacking.

CO4: Design new techniques and tools to solve real world security problems.

CO5: Apply appropriate ethical hacking techniques to provide solution for a given security problem

CO6. Undertake research to solve security problems at host, data and Network level.

**DETAILED SYLLABUS:**

**UNIT I :INTRODUCTION TO ETHICAL HACKING (11 Periods)**

Introduction, Ethical hacking terminology, Types of hacking technologies, phases of ethical hacking, Foot printing, Social Engineering, Scanning and enumeration.

**UNIT II: SYSTEM HACKING (11 Periods)**

Understanding the password hacking techniques, Rootkits, Trojans, Backdoors, Viruses and worms, sniffers.

**UNIT III: DENIAL OF SERVICE &WEB SERVER HACKING**

**(11 Periods)**

Denial of service, session hijacking, Hacking web servers, Web application vulnerability, web application vulnerabilities ,SQL Injection, Buffer overflow.



#### **UNIT IV: WIRELESS HACKING & PHYSICAL SECURITY**

**(11 Periods)**

WEP, WPA Authentication mechanism-wireless sniffers-Physical Security-factors affecting physical security-honeypots-Firewall types

#### **UNIT V: PENETRATION TESTING (11 Periods)**

Cryptography-overview of MD5, SHA, RC4, Penetration testing methodologies- Defining security assessment, overview, steps, pen test legal framework, penetration testing tools.

**Total Periods: 55**

#### **TEXT BOOK:**

1. *Kimberly graves "CEH Official Certified Ethical Hacker Review Guide,"* Wiley publications, 2007

#### **REFERENCE BOOKS:**

1. Micheal Gregg, "*Certified ethical hacker (CEH) Cert guide*", Pearson education, 2014.
2. Patrick Engebretson, "*The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy*", 2ed, Syngress Media, 2012.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

**Department of Computer Science and Engineering**

**I M. Tech (CN&IS) I-Semester**

**(16MT10507) INTERNET OF THINGS**

**(Professional Elective-1)**

**(Common to CS and CNIS)**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>-</b>	<b>--</b>	<b>4</b>

**PRE-REQUISITES:**

*Courses on "Computer Networks" and "Java"*

**COURSE DESCRIPTION:**

Domain Specific IoT's; M2M& System Management with Netconf-Yang; Developing Internet of Things Using Python; IoT Physical Devices & Case Studies Illustrating IoT Design

**COURSE OUTCOMES:**

After successful completion of this course, the students will be able to:

CO1: Gain knowledge on

- o Building blocks of Internet of Things and characteristics.
- o Application areas of IoT
- o Concept of M2M (machine to machine) with necessary protocols

CO2: Analyze Domain specific IoT's, revolution of Internet in Mobile Devices.

CO3: Design and Develop Techniques for solutions to solve the problems in IoT using Python Scripting Language.

CO4: Conduct research on domain specific IoT's and IoT enabling Technologies.

CO5: Acquire knowledge to recognize the opportunities and contribute to collaborative-multidisciplinary Scientific Research.

**DETAILED SYLLABUS:**

**UNIT I: INTRODUCTION & CONCEPTS (08 periods)**

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, Logical Design of IOT, IOT Enabling Technologies, IoT Levels and Templates

**UNITII: DOMAIN SPECIFIC IOTS (09 periods)**

Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health & Life Style

**UNITIII: M2M & SYSTEM MANAGEMENT WITH NETCONF-YANG**

**(11 periods)**

IoT and M2M – M2M, Difference between IOT and M2M, difference between SDN and NFV for IoT, Software defined networks, network function virtualization, Need for IOT Systems Management, Simple Network Management Protocol, Limitations of SNMP, Network Operator Requirements.

Basics of IoT System Management with NETCOZF, YANG, YANG-NETCONF

**UNITIV: DEVELOPING INTERNET OF THINGSUSING PYTHON  
(15 periods)**

Introduction, IOT Design Methodology, Installing Python, Language features of Python, Python Data Types & Data Structures, Control Flow, Functions, Modules, File Handling, Date/ Time Operations, Classes, Exception handling, Python Packages of Interest for IoT.

**UNIT V: IOT PHYSICAL DEVICES & ENDPOINTS (12 periods)**

What is an IOT Device, Exemplary Device, Board, Linux on Raspberry Pi, Interfaces, Programming and IOT Devices, Case Studies Illustrating IoT Design: Home Automation, Cities and Agriculture.

**Total Periods: 55**

**TEXT BOOK:**

1. Vijay Madiseti, Arshdeep Bahga, " *Internet of Things A Hands-On Approach*", University Press, 2015.

**REFERENCE BOOKS:**

1. Adrian McEwen, " *Designing the Internet of Things*", Wiley Publishers, 2014.
2. Daniel Kellmerein, " *The Silent Intelligence: The Internet of Things*", 2013, DND Ventures LLC, 2013.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M.Tech. (CN&IS) I Semester**  
**(16MT22508) SOFTWARE SECURITY**  
**(Professional Elective-1)**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	-	-	4

**PREREQUISITES:**

Courses on "Software Engineering," and "Network Security"

**COURSE DESCRIPTION:**

Importance of Security in Software - Security a Software Issue, Secure Software; Requirements Engineering for Secure Software; Security Principles in SDLC - Secure Software Architecture and Design, Secure Coding and Testing; Security and Complexity - System Assembly Challenges; Governance and Managing for more Secure Software.

**COURSE OUTCOMES:**

*After successful completion of this course, the students will be able to:*

- CO1: Gain knowledge on security issues in:
- Requirement Engineering
  - Architecture and Design
  - Coding and Testing
- CO2: Analyze complex software projects to describe security risks and mitigation techniques.
- CO3: Applying methods to detect software security defects, SQUARE process model for requirement gathering and coding practices & security testing for identifying security failures.
- CO4: Initiate research issues in code analysis techniques to improve software security.

**DETAILED SYLLABUS**

**UNIT-I: IMPORTANCE OF SECURITY IN SOFTWARE (Periods: 11)**

**Security a Software Issue:** Introduction, The problem, Software Assurance and Software Security, Threats to software security, Sources of software insecurity, Benefits of detecting software security defects early, managing secure software development.

**Secure Software:** Introduction, Properties of Secure Software, Influencing the security properties of software, Asserting and specifying the desired security properties.

**UNIT-II: REQUIREMENTS ENGINEERING (Periods: 10)**

**Requirements Engineering for Secure Software:** Introduction, Misuse and abuse cases, the SQUARE process Model, SQUARE sample outputs, Requirements elicitation, Requirements prioritization.

**UNIT-III: SECURITY PRINCIPLES IN SDLC (Periods: 11)**

**Secure Software Architecture and Design:** Introduction, Software Security practices for Architecture and Design - architectural risk

analysis, Software security knowledge for Architecture and Design - Security principles, Security guidelines and Attack patterns.

**Secure Coding and Testing:** Introduction, Code analysis, Coding Practices, Software Security testing, Security testing considerations throughout of the SDLC.

**UNIT-IV: SECURITY AND COMPLEXITY (Periods: 10)**

**System Assembly Challenges:** Introduction, Security failures, functional and attacker perspectives for security analysis in web services and identity management, system complexity drivers and security, Deep technical problem complexity.

**UNIT-V: GOVERNANCE AND MANAGING (Periods: 10)**

**Governance and Managing for more Secure Software:** Introduction, Governance and security, adopting an enterprise software security framework, Defining adequate security, Risk Management framework for software security, Security and Project Management, Maturity of Practice.

**[Total Periods: 52]**

**TEXTBOOK:**

1. Julia H. Allen, Sean Barnum, Robert J. Ellison, Gary McGraw, and Nancy R. Mead, "*Security Engineering: A Guide for Project Managers*," Pearson Education, 2009.

**REFERENCE BOOKS:**

1. Gary McGraw, "*Software Security: Building Security In*," Addison-Wesley, 2006.
2. Mark Dowd, John McDonald and Justin Schuh, "*The Art of Software Security Assessment: Identifying and Preventing Software Vulnerabilities*," 1ed, Addison-Wesley, 2006.
3. John Viega and Gary McGraw, "*Building Secure Software: How to Avoid Security Problems the Right Way*," Addison-Wesley, 2001.
4. G. Hoglund and G. McGraw, "*Exploiting Software: How to Break Code*," Addison-Wesley, 2004.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M. Tech. (CN&IS) I-Semester**  
**(16MT16331) COMPUTER NETWORKS & INFORMATION**  
**SECURITY LAB**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>50</b>	<b>50</b>	<b>100</b>	<b>--</b>	<b>--</b>	<b>4</b>	<b>2</b>

**PRE-REQUISITES:**

Courses on "Computer Networks" and "Information Security"

**COURSE DESCRIPTION:**

Hands experience on Data Link Layer Framing Methods; Routing Algorithms; Implementation of DES, RSA; AES Algorithms, Secure Hash Algorithms and Digital Signature Standards.

**COURSE OUTCOMES:**

After successful completion of this course, the students will be able to:

CO1. Gain knowledge to implement

- Framing mechanisms for data link layer
- Shortest path routing algorithms
- Symmetric encryption algorithms- DES,AES and Asymmetric algorithm-RSA
- Secure Hash algorithms and digital signatures

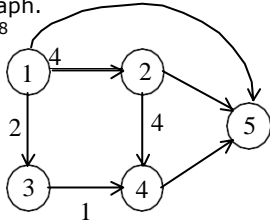
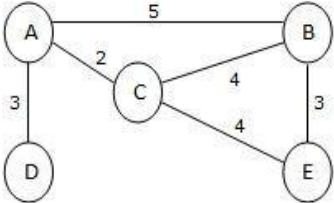
CO2. Analyze the routing algorithms, Symmetric-key encryption and public-key encryption algorithms.

CO3. Develop the solutions to solve the problems in networks and information security systems.

CO4. Implement routing and encryption techniques using C or JAVA to provide solutions to the real world problems.

**Laboratory Exercises:**

Exercise Number.	Name of Experiment	No. of slots
1	Implement the following data link layer framing methods. a. Character Count b. Character Stuffing c. Bit Stuffing	1
2	Design a program to compute checksum for the given frame 1101011011 using CRC-12, CRC-16, CRC-CCIP. Display the actual bit string transmitted. Suppose any bit from is inverted during transmission. Show that this error is detected at the receivers end.	1

3	<p>Implement Dijkstra's algorithm to compute the Shortest path through a graph.</p> 	1
4	<p>Design a program to obtain routing table for each node using distance vector routing algorithm by considering the given subnet with weights indicating delay between nodes.</p> 	1
5	Write a program to simulates flow based routing	1
6	Simulate the Random Early Detection congestion control algorithm	1
7	Write a program to encrypt and decrypt given text using DES symmetric key algorithm	1
8	Write a program to encrypt and decrypt given text in public key cryptographic system using RSA	1
9	Write a program to encrypt and decrypt given text using AES algorithm with 128-bit key	1
10	Write a program to generate a Hash code for the given text using SHA-512 algorithm	1
11	Create a digital signature for the given doc/pdf file using DSS algorithm	1
12	Configure Firewall filters to accept/reject URLs/web content	1

**REFERENCE BOOKS:**

1. William Stallings, "Network Security Essentials: Applications and Standards," 4ed, New Delhi, Pearson Education, 2011
2. Nader F. Mir, "Computer and Communication Networks," Pearson Education, 2007
3. Eric Maiwald, "Fundamentals of Network Security", 4ed, Tata McGraw Hill, 2003

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

Department of Computer Science and Engineering

M. Tech (CN&amp;IS) I-Semester

**(16MT16332) WEB TECHNOLOGIES LAB**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>50</b>	<b>50</b>	<b>100</b>	<b>-</b>	<b>-</b>	<b>4</b>	<b>2</b>

**PRE-REQUISITES:***Course on "Programming in C, and Java"***COURSE DESCRIPTION:**

This course is hands-on and project-based; students will construct a substantial dynamic web application based on the concepts, technologies, and techniques presented during lecture.

**COURSE OUTCOMES:**

After completion of this course the students will be able to:

- CO1. Gain knowledge in designing web pages using HTML, CSS, JS, PHP.
- CO 2. Analyze the design problems in HTML Web pages with CSS
- CO3. Design a dynamic webpage with HTML, CSS, Java Script, PHP concepts
- CO4. Assess the HTML Website using XML Parsers
- CO 5. Engage in lifelong learning by incorporating the best design practices.

**LIST OF EXERCISES:**

<b>Exercise number.</b>	<b>Name of the Exercise</b>	<b>No. of Slots required</b>
1.	Create an HTML web page with at least the following features: Keywords & description meta tags, title, Page formatting, including a background color <i>and</i> picture, a non-default text color, and non-default text and link colors, A horizontal rule, At least three levels of headers, Text formatting, including specifying a non-default font as well as centered, bold, italics, subscript, superscript, and strikethrough, A three-level bulleted list and a two-level numbered list, At least two external links, with one a text link and one an image link, Three internal "bookmark" links – that is, a link to further down on the current page, A relative link to an image in a different directory than the directory in which your current HTML page resides, An image with a non-standard-width border in a non-standard color. The image should appear off to the right side of the page, An image map with at least three links, A table that includes at least three rows, two cells in each row, two	1



	colspan attributes, and one rowspan attribute. Put a background color on the entire table, a different background color on one cell, and a background image on one entire row of the table.	
2.	<p>Develop static pages (using only HTML) of an online Book store. The pages should resemble: <a href="http://www.amazon.com">www.amazon.com</a>.</p> <p>The website should consist of the following pages.</p> <ul style="list-style-type: none"> <li>• Books catalogue</li> <li>• Shopping cart</li> <li>• Payment by credit card</li> <li>• Order Conformation</li> </ul>	1
3.	<p>Design a web page using CSS which includes the following:</p> <ol style="list-style-type: none"> <li>1) Use different font styles</li> <li>2) Set background image for both the page and single elements on page.</li> <li>3) Control the repetition of image with background-repeat property</li> <li>4) Define style for links as a:link, a:active, a:hover, a:visited</li> <li>5) Add customized cursors for links.</li> <li>6) Work with layers</li> </ol>	1
4.	<p>Create an HTML web page with JavaScript for the following problem:</p> <p>Get two input numbers from an HTML form. On submit, call a function to edit them to make sure that they are within the range of 1-100. If not, display an error message and set focus to the field in error. If the entered numbers are valid, add the two numbers together and display the total in an alert box. Pop up a prompt box to get a third number and edit it to make sure it's in the range of 1 to 5. Multiply the original total (from the two input boxes) by this third number. Store the result in a cookie and then automatically open a second page to display the cookie that you saved on the prior page.</p>	1
5.	Validate the registration, user login, user profile and payment by credit card pages using JavaScript.	1
6.	<p>a. Write an XML file which will display the Book information which includes the following:</p> <ol style="list-style-type: none"> <li>1) Title of the book</li> <li>2) Author Name</li> <li>3) ISBN number</li> <li>4) Publisher name</li> <li>5) Edition</li> <li>6) Price</li> </ol>	1

7.	b. Write a Document Type Definition (DTD) to validate the above XML file. Display the XML file as follows: The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns. Use XML schemas XSL and CSS for the above purpose. Note: Give at least for 4 books. It should be valid syntactically. Hint: You can use some xml editors like XML-spy	1
8	Write PHP Script to demonstrate a. String processing in PHP b. File uploading	1
9	Write PHP Script to demonstrate Sessions and Cookies	1
10	Write a PHP which inserts the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database	1
11	Write a PHP which does the following job: Insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database	1

**REFERENCE BOOKS:**

1. Chris Bates, "Web Programming: Building Internet Applications," 3ed, Wiley India Pvt. Ltd., New Delhi, 2009.
2. W Jason Gilmore, "Beginning PHP and MySQL: From Novice to Professional," 4ed, New Delhi, India: Springer India Pvt. Ltd., 2011.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M. Tech.(CN&IS) I-Semester**  
**(16MT13808) RESEARCH METHODOLOGY**  
**(Common to all M. Tech. Programs)**  
**(Audit Course)**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
-	-	-	-	2	-	-

**PREREQUISITES: --**

**COURSE DESCRIPTION:**

Overview of Research, research problem and design, various research designs, data collection methods, statistical methods for research, importance of research reports and its types.

**COURSE OUTCOMES:** After completion of the course, students should be able to:

- CO1. Acquire in-depth knowledge on  
     Research design and conducting research  
     Various data collection methods  
     Statistical methods in research  
     Report writing techniques.
- CO2. Analyze various research design issues for conducting  
     research in core or allied areas
- CO3. Formulate solutions for engineering problems by conducting  
     research effectively in the core or allied areas
- CO4. Carryout literature survey and apply research methodologies  
     for the development of scientific/technological knowledge  
     in one or more domains of engineering.
- CO5. Select and Apply appropriate techniques and tools to complex  
     engineering activities in their respective fields
- CO6. Write effective research reports.
- CO7. Develop attitude for lifelong learning to do research.
- CO8. Develop professional code of conduct and ethics of research.

**DETAILED SYLLABUS:**

**Unit-I: Introduction to Research Methodology (Periods: 5)**

Objectives and Motivation of Research, Types of Research, Research Approaches, Research Process, Criteria of good Research, Defining and Formulating the Research Problem, Problem Selection, Necessity of Defining the Problem, Techniques involved in Defining a Problem.

**Unit-II: Research Problem Design and Data Collection Methods (Periods: 7)**

Features of Good Design, Research Design Concepts, Different Research Designs, Different Methods of Data Collection, Data preparation: Processing Operations, Types of Analysis.

**Unit-III: Statistics in Research (Periods: 6)**

Review of Statistical Techniques - Mean, Median, Mode, Geometric and Harmonic Mean, Standard Deviation, Measure of Asymmetry, ANOVA, Regression analysis.

**Unit-IV: Hypothesis Testing****(Periods: 7)**

Normal Distribution, Properties of Normal Distribution, Basic Concepts of Testing of Hypothesis, Hypothesis Testing Procedure, Hypothesis Testing: t-Distribution, Chi-Square Test as a Test of Goodness of Fit.

**Unit-V: Interpretation and Report Writing** **(Periods: 3)**

Interpretation – Techniques and Precautions, Report Writing – Significance, Stages, Layout, Types of reports, Precautions in Writing Reports.

**Total Periods: 28****Text Book:**

1. C.R. Kothari, "Research Methodology: Methods and Techniques," 2ed, New Age International Publishers, New Delhi, 2004.

**Reference Books:**

- 1) Ranjit Kumar, "Research Methodology: A step-by-step guide for beginners," 3ed, Sage South Asia, 2011.
- 2) R. Panneerselvam, "Research Methodology," PHI learning Pvt. Ltd., 2009

## **SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

**Department of Computer Science and Engineering**

**I M. Tech (CN&IS) II-Semester**

**(16MT20502) BIG DATA ANALYTICS**

**(Common to CS & CNIS)**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>--</b>	<b>--</b>	<b>4</b>

### **PRE-REQUISITES:**

Courses on "Data Base Management Systems" & "Data Warehousing and Data Mining"

### **COURSE DESCRIPTION:**

Concepts of Big Data; Types of Data Elements; Introduction to Hadoop; Hadoop Ecosystems; MapReduce; Building Blocks of Hadoop; big data analytics applications; Predictive and Descriptive Analytics.

### **COURSE OUTCOMES:**

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

CO1. Demonstrate in depth knowledge in

- Big data Characteristics
- Hadoop Framework
- MapReduce.
- Hadoop Release

CO2. Analyze and develop solutions for database systems for storing and analyzing the large data.

CO3. Apply Big Data Analytics for estimating the data sets to solve the real world problems

CO4. Design and model for an effective database by using big data tools.

CO5. Carry out research on predictive analysis and sentiment analysis.

CO5. Learning advance analytics techniques for effective Database monitoring.

### **DETAILED SYLLABUS:**

#### **UNIT I– Introduction to Big data: (10 periods)**

Big Data Characteristics: Volume-Variety-Velocity-Veracity, Analytics, Basic Nomenclature, Analytics Process Model, Analytical Model Requirements, Types of Data Sources, Sampling, Types of Data Elements, Missing Values, Standardizing Data, Outlier Detection and Treatment, Categorization.

#### **UNIT II –Introduction to Hadoop: (10 periods)**

Data, data types, Storage and Analysis, Relational Database Management Systems, Grid Computing, Volunteer Computing, A Brief History of Hadoop, Apache Hadoop and the Hadoop Ecosystem.

#### **UNIT III – MapReduce: (11 periods)**

A weather Dataset: Data format, Analyzing the data with Unix tools, Analyzing the data with Hadoop: MapReduce, Java MapReduce, Scaling Out: Data Flow, Combiner Functions, Running a Distributed MapReduce Job, Hadoop Streaming: Ruby, Python, Hadoop Pipes, Compiling and Running.

**UNIT IV – Hadoop Releases:****(11 Periods)**

The Building Blocks of Hadoop: Name Node-Data Node-Secondary Name Node-Job Tracker-Task Tracker.

BIG DATA ANALYTICS APPLICATIONS: Back Testing Analytical Model, Credit Risk Modeling, Fraud Detection, Net Lift Response, Web Analytics, Social Media Analytics, and Business Process Analytics.

**UNITV–PREDICTIVE ANALYTICS AND DESCRIPTIVE ANALYTICS****(11 Periods)**

**Predictive Analytics:** Target Definition, Linear Regression, Logistic Regression, Decision Trees, Support Vector Machines, Ensemble Methods, Multiclass Classification Techniques, Evaluating Predictive Models.

**Descriptive Analytics:** Association Rules, Sequence Rules.

**Total No. of Periods: 53****TEXT BOOKS:**

1. Bart Baesens, *"Analytics in a Big Data World: The Essential Guide to Data Science and its Applications,"* Wiley Publications, 2014.
2. Tom White, *"Hadoop: The Definitive Guide,"* 3ed, O'REILLY Publications, 2012.

**REFERENCE BOOKS:**

1. Paul Zikopoulos, IBM, Chris Eaton, Paul Zikopoulos *"Understanding Big Data: Analytics for Enterprise Class Hadoop and streaming Data,"* The McGraw-Hill Companies, 2012.
2. Chuck Lam, *"Hadoop in Action,"* Manning Publications, 2011.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M.Tech. (CNIS) II Semester**  
**(16MT12501) CLOUD COMPUTING**  
**(Common to SE, CS & CNIS)**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	-	-	4

**PREREQUISITES:**

*Courses on "Operating Systems" and "Computer Networks"*

**COURSE DESCRIPTION:**

Virtualization, Case studies – XEN, VMware, Microsoft Hyper-V; Cloud architecture; Services and Applications; Cloud Programming; Industry practices and Case studies –Amazon Web Services, Google App Engine, and Microsoft Azure.

**COURSE OUTCOMES:**

*After successful completion of this course, students will be able to:*

- CO1: Demonstrate knowledge on Virtualization models, Cloud Architecture, Services and Programming concepts.
- CO2: Analyze the problems in existing cloud architectures.
- CO3: Apply concurrent programming, throughput computing and Data intensive computing in Cloud programming.
- CO4: Conduct research on emerging technologies in cloud and energy management in cloud
- CO5: Apply virtualization techniques to optimize resource sharing.

**DETAILED SYLLABUS:**

**Unit I: INTRODUCTION TO VIRTUALIZATION (9 Periods)**

Characteristics of Virtualized Environments, Taxonomy of Virtualization Techniques, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples – XEN, VMware, Microsoft Hyper-V.

**UNIT II: CLOUD ARCHITECTURE (11 Periods)**

**Introduction to Cloud:** Defining Cloud Computing, Cloud Types - The NIST model, The Cloud Cube Model, Deployment models, Service models, Examining the Characteristics of Cloud Computing, Paradigm shift, Benefits of cloud computing, Disadvantages of cloud computing, Assessing the Role of Open Standards.

**Cloud Architecture:** Exploring the Cloud Computing Stack, Composability, Infrastructure, Platforms, Virtual Appliances, Communication Protocols, and Applications.

**UNIT III: DEFINING CLOUD SERVICES (10 Periods)**

**Defining Infrastructure as a Service (IaaS)** – IaaS workloads, Pods, aggregation, and silos, **Defining Platform as a Service (PaaS), Defining Software as a Service (SaaS)** – SaaS characteristics, Open SaaS and SOA, Salesforce.com and CRM SaaS, **Defining Identity as a Service (IDaaS)** – Introduction to identity,

Networked identity service classes, Identity system codes of conduct, IDaaS interoperability, **Defining Compliance as a Service (CaaS)**.

**UNIT IV: CLOUD PROGRAMMING CONCEPTS (12 Periods)**

**Concurrent Programming** – Introduction to Parallelism for Single Machine Computation, Programming Applications with Threads, **High Throughput Computing** – Task Programming, Task based Application Models, **Data Intensive Computing** – Introduction to Data Intensive Computing and Technologies for Data Intensive Computing.

**UNIT V: INDUSTRIAL PLATFORMS AND TRENDING DEVELOPMENTS (13 Periods)**

**Case Studies on Cloud Platforms** – Amazon Web Services, Google App Engine, and Microsoft Azure, Case Studies on Cloud Applications – Scientific Applications, Business and Consumer Applications.

**Enhancements in Cloud** – Energy Efficiency in Clouds, Market based Management of Clouds, Federated Clouds / InterCloud, Third Party Cloud Services.

**Total Periods: 55**

**TEXT BOOKS:**

1. Rajkumar Buyya, Christian Vecchiola, and S. Thamarai Selvi, "*Mastering Cloud Computing: Foundations and Applications Programming*," 1ed, McGraw Hill, New Delhi, 2013.
2. Barrie Sosinsky, "*Cloud Computing Bible*," 1ed, Wiley India Pvt Ltd, New Delhi, 2011.

**REFERENCE BOOKS:**

1. Toby J. Velte , Anthony T. Velte, and Robert Elsenpeter, "*Cloud Computing: A Practical Approach*," 1ed, Tata McGraw Hill, 2010.
2. George Reese, "*Cloud Application Architectures*," 1ed, O'Reilly Publishers, 2010.



## **SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

**Department of Computer Science and Engineering**

**I M. Tech (CN&IS) II-Semester**

### **(16MT26301) INTRUSION DETECTION SYSTEMS**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>--</b>	<b>--</b>	<b>4</b>

#### **PRE-REQUISITES:**

Courses on "Computer Networks" and "Network security"

#### **COURSE DESCRIPTION:**

Introduction to threats , attacks and intrusions; Network security monitoring and Sinkhole design; Traffic threat assessment and network incident response; Malicious bots and botnet construction; introduction to network forensics and Intrusion prevention systems(IPS) in host and network level.

#### **COURSE OUTCOMES:**

*After successful completion of this course, students will be able to:*

**CO1:** Gain Knowledge on Intrusions, security monitoring, Network Forensic principles and Intrusion Prevention system (IPS).

**CO2:** Analyze the threats and vulnerabilities in the network traffic for designing the solutions.

**CO3:** Detect, identify and mitigate the security attacks from the network traffic to provide the solutions to the real word problems.

**CO4:** Conduct research to identify novel solutions for detecting and mitigation of Intrusions in public and private networks.

**CO5:** Gain exposure on IDS and IPs tools of Intrusion and Extrusion detection for NSM data collections.

#### **DETAILED SYLLABUS:**

#### **UNIT I: NETWORK SECURITY MONITORING REVISITED AND EXTRUSION DETECTION ILLUSTRATED (12 periods)**

**Network Security Monitoring Revisited:** Defining the security process, Principles, Network security monitoring (NSM) Theory, Techniques and tools. Defensible Network Architecture- Defensible network Monitoring, Controlling, Minimizing and current.

**Extrusion Detection Illustrated:** Definition of Intrusion detection, Definition of Extrusion detection, History of Extrusion detection and Extrusion detection through NSM

#### **UNIT II LAYER-3 NETWORK ACCESS CONTROL AND TRAFFIC THREAT ASSESSMENT (10 periods)**

**Layer-3 Network Access Control:** Internal network Design, ISP sink holes, Enterprise sink holes and Internal intrusion containment.

**Traffic Threat Assessment:** Assumptions, First cuts, looking for odd traffic, Inspecting individual services through NTP, ISAKMP, ICMP, Secure shell, WhoIs, LDAP, other ports.

### **UNIT III : NETWORK INCIDENT RESPONSE AND NETWORK FORENSICS (11 periods)**

**Network Incident Response:** Preparation for network incident response, Secure CSIRT communication, Intruder Profiles, Incident Detection Methods, Network First Response, Network-Centric General Response and Remediation.

Collecting network traffic as evidence, protecting and preserving network based evidence, Analyzing network based evidence, presenting and defending conclusions.

### **UNIT IV : MALICIOUS BOTS AND INTRUSION PREVENTION OVERVIEW (11 periods)**

Traffic Threat Assessment Case Study, Malicious Bots: IRC bots, communication and identification, server and control channels, exploitation and bot admin.

Intrusion Prevention Overview, Signatures and Actions: Types, Triggers and actions, Operational Tasks: deploying & configuring IPS devices and applications, Monitoring IPS activities, Securing IPS communications

### **UNIT V: HOST INTRUSION PREVENTION AND NETWORK INTRUSION PREVENTION (11 periods)**

Host Intrusion Prevention Overview, Capabilities, Benefits, Limitations, HIPS Components: End agents, Gathering data about the operation, state, security policy and Infrastructure.

Network Intrusion Prevention Overview, Capabilities, Benefits, Limitations, NIPS Components: Capturing, Analyzing, Responding to Network Traffic, Sensor management and Monitoring.

**Total Periods: 55**

#### **TEXT BOOKS:**

1. Richard Bejtlich, "*Extrusion Detection: Security Monitoring for Internal Intrusions*," 1ed. Pearson Education, New Delhi, 2004.
2. Earl Carter, Jonathan Hogue, "*Intrusion Prevention Fundamentals*," 1ed, Pearson Education, New Delhi, 2002.

#### **REFERENCE BOOKS:**

1. Carl Endorf, Eugene Schultz and Jim Mellander, "*Intrusion Detection and Prevention*," McGraw-Hill, 2004
2. Stephen Northcutt, Judy Novak, "*Network Intrusion Detection*," New Riders Publishing, 3ed, 2002

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

**Department of Computer Science and Engineering**

**I M.Tech (CN&IS). II-Semester**

**(16MT26302) NETWORK PROGRAMMING**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>-</b>	<b>-</b>	<b>4</b>

**PRE-REQUISITES:**

Courses on "Computer Networks" and "Unix Programming"

**COURSE DESCRIPTION:**

Concepts of Unix Standards; Protocol Usage by common internet application; Elementary TCP Sockets; Handling server process termination; crashing and rebooting; IPV6socket options; Interface with UDP; Function and IPV6 support; I/O multiplexing IPC creating and opening channels, permissions; Terminal Modes, Remote login overview;

**COURSE OUTCOMES:**

After successful completion of this course, the students will be able to:

CO1: Gain knowledge in

- Basic concepts of UNIX standards, networks and socket functions.
- TCP and UDP socket API and related functions.
- DNS and address conversions.
- I/O Multiplexing, IPC and RPC.

CO2: Analyze the key protocols that support the Internet and several common programming interfaces for network communication.

CO3: Solve I/O Multiplexing issues using TCP socket programming.

CO4: Design client server architecture by developing new TCP and UDP socket functions.

CO5: Apply appropriate techniques and tools to implement algorithms for modern network architectures.

**DETAILED SYLLABUS:**

**UNIT I- INTRODUCTION TO NETWORK PROGRAMMING**

**(13periods)**

OSI model, UNIX standards, TCP and UDP & TCP connection establishment and Termination, SCTP Association Establishment and Termination, Port Numbers, TCP Port numbers and Concurrent Servers, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

**Sockets:** Socket Address structures, value result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

## **UNIT II – TCP AND UDP SOCKETS (12 periods)**

**TCP client server:** Introduction, TCP Echo server functions, Normal startup and Termination, POSIX signal handling, Handling SIGCHLD signals, wait and wait pid functions, Connection Abort before accept returns, server process termination, Crashing and Rebooting of server host shutdown of server host.

**Elementary UDP sockets:** Introduction UDP Echo server function, Verifying Received Responses, Server not running, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

## **UNIT III –I/O MULTIPLEXING AND SOCKET OPTIONS**

**(10 periods)**

I/O Models, select function, shutdown function, poll function, pselect function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option IPV6 socket option and TCP socket options, fcntl function.

## **UNIT IV –ELEMENTARY NAME AND ADDRESS CONVERSIONS**

**(8 periods)**

DNS, getxxx() related functions, Resolver option, Function and IPV6 support, uname function, Obsolete IPV6 Address Lookup Functions, and other networking information.

## **UNIT V – IPC AND REMOTE PROCEDURE CALL (10 periods)**

**IPC:** Posix IPC, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system IPC, Message queues, Semaphores and Shared Memory. Introduction to RPC and Transparency Issues, Sun RPC, dup, dup2 System calls.

**Total Periods: 55**

### **TEXT BOOKS:**

1. W.Richard Stevens, "UNIX Network Programming: The Sockets Networking API-1," 3ed, PHI, 2010.
2. W.Richard Stevens, "UNIX Network Programming Inter process Communications," 2ed, PHI, 2004.

### **REFERENCE BOOKS:**

1. W.Richard Stevens, "UNIX Network Programming," 2ed, Pearson Education,2008.
2. M.J. Rockkind, "Advanced Unix Programming," 2ed, Pearson Education, 2005.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

**Department of Computer Science and Engineering**

**I M. Tech (CN&IS)– II Semester**

**(16MT26303) WIRELESS NETWORKS**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>-</b>	<b>-</b>	<b>4</b>

**PRE-REQUISITES:**

*A Course on "Computer Networks"*

**COURSE DESCRIPTION:**

Queuing theory; Mobile Radio Propagation; Channel Coding and Error Control; Multiple Radio Access, Multiple Division Techniques For Traffic Channels; Ad Hoc Networks and Sensor Networks; Wireless LANs; PANs, BANs and MANs.

**COURSE OUTCOMES:**

*After successful completion of this course, students will be able to:*

- CO1. Acquire knowledge in physical layer, data link layer, network layer and transport layer of wireless networking models.
- CO2. Analyse the traffic theories, mobile radio propagation, channel coding, cellular concepts to measure the performance.
- CO3. Conduct research to develop routing protocols for MANETs to solve real world problems.
- CO4. Develop solution for complex problems using networking tools

**DETAILED SYLLABUS:**

**UNIT I: INTRODUCTION, PROBABILITY, STATISTICS, AND TRAFFIC THEORIES (11 periods)**

**Introduction**-Characteristics and Fundamentals of cellular Systems, Cellular System Infrastructure, Cellular Concept- Cell area, Signal strength and Cell Parameters, Capacity of a Cell, Frequency Reuse, How to form a cluster, Cochannel Interference, Cell Splitting, Cell Sectoring.

**Probability, Statistics, and Traffic Theories**- Introduction, Basic Probability and Statistics Theories, Traffic Theory, Basic Queuing Systems

**UNIT II – MOBILE RADIO PROPAGATION, CHANNEL CODING AND ERROR CONTROL (11 periods)**

**Mobile Radio Propagation**-Introduction, Types of Radio Waves, Propagation Mechanisms, Free Space Propagation, Land Propagation, Path Loss, Slow Fading, Fast Fading, Doppler Effect, Delay Spread, Inter symbol Interference, Coherence Bandwidth, Cochannel Interference.

**Channel Coding and Error Control**- Introduction, Linear Block Codes, Cyclic Codes, Cyclic Redundancy Check, Convolutional Codes, Interleaver, Turbo Codes, ARQ Techniques.

**UNIT III – MULTIPLE RADIO ACCESS, MULTIPLE DIVISION TECHNIQUES FOR TRAFFIC CHANNELS (11 periods)**

**Multiple Radio Access**- Introduction, Multiple Radio Access Protocols, Contention Based Protocols.

**Multiple Division Techniques for Traffic Channels-** Introduction, Concepts and Models for Multiple Divisions, Modulation Techniques  
**Network Protocols-** TCP over Wireless, Internet Protocol Version (IPV6)

**UNIT IV –AD HOC NETWORKS AND SENSOR NETWORKS**

**(11 periods)**

**Ad Hoc Networks** - Introduction, Characteristics of MANETs, Applications, Routing in MANETs - DSDV,AODV,DSR, ZRP.

**Sensor Networks-** Introduction, Fixed Wireless Sensor Networks, Wireless Sensor Networks, Sensor Deployment, Network Characteristics, Design Issues in Sensor Networks, Secured Communication in Wireless Sensor Networks.

**UNIT V – WIRELESS LANS, PANS, BANS AND MANS (11 periods)**

Wireless LANs, PANS, BANs and MANs-Introduction, ETSI High-Performance LAN (Hiper LAN), Wireless Personal Area Networks (WPANs), IEEE 802.15.1, Zigbee, Wireless Body Area Networks (WBANs), WMANs Using Worldwide Inter-operability for Microwave Access(WiMAX), WMAN Using a Mesh Network, WMANs Using 3GPP and Long Term Evaluation(LTE), WMAN Using Long Term Evaluation (LTE) and LTE – A.

**Total Periods: 55**

**TEXT BOOK:**

- 1 .Dharma Prakash Agarwal, Qing-AnZeng, "*Introduction to Wireless & Mobile Systems,*" 4ed, Cengage Learning, 2016.

**REFERENCE BOOK:**

1. Theodore S. Rappaport, "*Wireless Communications–Principles and Practice,*"2ed, PHI, 2002.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M.Tech (CN&IS). II-Semester**  
**(16MT10506) INFORMATION RETRIEVAL SYSTEMS**  
**(Professional Elective-2)**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	--	--	4

**PRE-REQUISITE:**

*A Course on "Database Management Systems"*

**COURSE DESCRIPTION:**

Concepts of Information retrieval Systems; Indexing and data structures; indexing, Document and term clustering; user search techniques; Text search algorithms, information system Evaluation;

**COURSE OUTCOMES:**

After successful completion of this course, students will be able to:

CO1 : Acquire knowledge in fundamental concepts of

- Information Retrieval System capabilities
- Data Structures
- Indexing and Search Algorithms

CO2: Analyze concepts of Database, Data Warehouses of real time applications related to Document Store, Document data warehouses, judicial, biomedical, scientific documents.

CO3: Solve complex search problems like ranking , weighted ,software text searches by implementing A\* Search, Zipf and Information retrieval frame work

CO4: Initiate research to identify and develop algorithms for indexing, clustering and searching

CO5: Create and apply online Information Retrieval Systems like search engines.

**DETAILED SYLLABUS:**

**UNIT I: INTRODUCTION TO INFORMATION RETRIEVAL SYSTEM**

**(periods: 11)**

Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses

**Information Retrieval System Capabilities:** Search, Browse.

**UNIT II: INDEXING AND DATA STRUCTURES (periods: 11)**

Objectives of Indexing, Indexing Process, Automatic Indexing

**Data Structures:** Introduction to Data Structures, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Hypertext data structure.

**UNIT III: AUTOMATIC INDEXING AND CLUSTERING**

**(periods: 10)**

Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing. **Document and Term Clustering:** Introduction to

Clustering, Thesaurus generation, Manual clustering, Automatic Term Clustering, Hierarchy of clusters.

**UNIT IV: USER SEARCH TECHNIQUES (periods: 12)**

Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems.

**UNIT V: TEXT SEARCH ALGORITHMS (periods: 11)**

Introduction to Text Search Techniques, Software text search algorithms, Hardware text search systems.

**Information System Evaluation:** Introduction to Information System Evaluation, Measures used in system evaluation.

**Total No. of periods (55)**

**TEXT BOOK:**

1. Kowalski, Gerald, Mark T Maybury Kluwer, "*Information Storage and Retrieval Systems: Theory and Implementation*", 2ed, Springer, Seventh Indian reprint 2 , 2013...

**REFERENCE BOOKS:**

1. Ricardo Baeza-Yates ,"*Modern Information Retrieval*" , Pearson Education, 2007
2. David A Grossman and Ophir Frieder, "*Information Retrieval: Algorithms and Heuristics*", 2ed, Springer, 2012.



## SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

Department of Computer Science and Engineering

I M. Tech. (CN&IS) II-Semester

(16MT26304) COMPUTER FORENSICS

(Professional Elective-2)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	--	--	4

### PRE-REQUISITES:

A Course on "Information Security"

### COURSE DESCRIPTION:

Concepts of computer forensic technologies and cybercrime; Evidence collection and data seizure; Initial Response and Forensic Duplication; Forensic Data Analysis and Validation; Processing crimes and incident scenes; Mobile Device Forensics, Network forensics and E-Mail Investigations

### COURSE OUTCOMES:

After successful completion of this course, students will be able to:

CO1: Acquire knowledge in

- Computer Forensic Fundamentals and Technologies
- Evidence and Data Capture and Computer Forensic Analysis
- Law Enforcement crime and incident scenes

CO2: Analyze and validate forensic data related to mobile devices, E-Mails.

CO3: Provide solutions for a wide range of forensic problems like attack on routers, E-Mail crimes.

CO4: Conduct research and contribute in groups for the development of new forensics tools.

CO5: Create and apply appropriate forensic tools, techniques to capture the evidence and investigate crimes

### DETAILED SYLLABUS

#### UNIT – I: OVERVIEW OF COMPUTER FORENSICS TECHNOLOGY AND CYBERCRIME (10 periods)

**Computer Forensics Fundamentals:** Introduction to computer Forensics, Use of computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists.

**Types of Computer Forensics Technologies:** Types of Military Computer Forensic Technology, Types of Law Enforcement- Computer Forensic Technology, Types of Business Computer Forensic Technology.

**Introduction to Cybercrime:** Introduction to Cybercrime, Cybercrime and Information Security, Cybercriminals, Classification of Cybercrimes, Cyber Detectives, Tools: Dig-x/nslookup, Whois, Ping.

#### UNIT – II: COMPUTER FORENSICS EVIDENCE AND (10 periods)

**Data Recovery:** Data back-up and Recovery, Role of Back-up in Recovery, Data-Recovery solution.

**Evidence Collection and Data Seizure:** Importance of Collect Evidence, Collection Options ,Obstacles, Types of Evidence, The Rules of Evidence, Volatile Evidence, General Procedure – Collection and Archiving, Methods of Collection, Artifacts, Collection Steps, Controlling Contamination: The Chain of Custody.

**UNIT – III: INITIAL RESPONSE AND FORENSIC DUPLICATION (12 periods)**

Initial Response & Volatile Data Collection from Windows system - Initial Response & Volatile Data Collection from Unix system. Forensic duplication: Forensic Duplicates as Admissible Evidence, Forensic Duplication Tool Requirements, Creating a Forensic Duplicate/Qualified Forensic Duplicate of a Hard Drive, Live Data Collection for Systems (Windows & Unix).

**UNIT -IV: COMPUTER FORENSIC ANALYSIS (12 periods)**

**Data Analysis and Validation:** Determining what data to collect and analyze, Validating forensic data, Addressing data, Hiding techniques, Performing remote acquisitions.

**Processing Crime and Incident Scenes:** Identifying digital evidence, Collecting evidence in private-sector incident scenes, Mobile Forensic Unit, Processing law enforcement crime, Preparing for a search, Seizing Digital Evidence at the Scene, Storing Digital Evidence.

**UNIT – V: FORENSICS IN VARIOUS AREAS (10 periods)**

**Cell Phone & Mobile Device Forensics :** Understanding Mobile Device Forensics, Acquisition Procedures for Cell Phones and Mobile Devices, Tool kits for hand-Held device forensics like EnCase, Device Seizure and PDA Seizure.

**Network Forensics:** Overview, Performing Live Acquisitions, Developing Standard Procedure for Network Forensics, Investigating Routers, Network Tools.

**E-Mail Investigation:** Exploring the role of E-Mail in investigations, Investigating E-Mail Crimes and Violations.

**Total periods: 54**

**TEXT BOOKS:**

1. John R.Vacca, "*Computer Forensics, Computer Crime Investigation*" 1ed, Firewall Media, New Delhi ,2009.
2. Nelson, Amelia Phillips, Christopher Steuart, "*Computer Forensics and Investigations*", 4ed, Cengage Learning, 2009.

**REFERENCE BOOKS:**

1. Sunit Belapure, Nina Godbole, "*Cyber Security: Understanding Cyber Crimes, Computer Forensics And Legal Perspectives*", 1ed, Wiley India Pvt Ltd, 2011.
2. Kevin Mandia, Chris Prorise, "*Incident Response and Computer Forensics*", 2ed, McGraw-Hill Osborne Media, 2003
3. Eoghan Casey, "*Handbook Computer Crime Investigation's Forensic Tools and Technology*", 1ed, Academic Press, 2001.
4. Peter Stephenson, Keith Gilbert, "*Investigating Computer Related Crime*", 2ed, CRC Press, 2004.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M Tech (CN&IS) II-Semester**  
**(16MT26305)DATABASE SECURITY**  
**(Professional Elective-2)**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>--</b>	<b>--</b>	<b>4</b>

**PRE-REQUISITES:**

A course on "Database Management Systems"

**COURSE DESCRIPTION:**

Explore database access controls; data obscurity and physical database security; Password Policies, Privileges; fraud detection through the use of audit tables & triggers and obscurity through the use of encryption; views & virtual private databases.

**COURSE OUTCOMES:**

After successful completion of this course, students will be able to:

CO1: Acquire knowledge in

- Information System Security
- Design of Secure Databases.
- Database System Models and Applications.
- Need for database security architecture.

CO2: Analyze fundamental database security threats, vulnerabilities and associated risks.

CO3: Implement specific database security solutions that include: access controls, audit/control and obscurity (encryption, views, and VPDs) mechanisms.

CO4: Create database security architecture, database user roles using SQL Server

CO5: Conduct research on establishment of strong passwords and manage th resources through database audit/access controls.

CO6: Recognize database security issues, implementation methods to database security mechanisms and strategies in life- long learning.

**DETAILED SYLLABUS:**

**UNIT-I: SECURITY ARCHITECTURE AND OPERATING SYSTEM SECURITY FUNDAMENTALS (11 periods)**

**Security Architecture:** Introduction, Security, Information Systems, Database Management Systems, Information Security, Information Security Architecture, Database Security, Asset Type and their Values, Security Methods.

**Operating System Security Fundamentals:** Operating System Security Environment, Components, Authentication Methods, user Administration, Password Policies, Vulnerabilities.

**UNIT-II: ADMINISTRATION OF USERS AND PROFILES, PASSWORD POLICES, PRIVILEGES (10 periods)**

**Administration of Users:** Introduction, Documentation of User Administration, Operating System Authentication, Creating Users, Creating SQL Server User, Removing Users, Modifying Users, Default Users, Remote Users, Database Links, Linked Servers, Remote Servers, Practices for Administrators and Managers.

**Profiles, Password Polices, Privileges:** Defining and Using Profiles, Designing and Implementing Password Polices, Granting and Revoking User Privileges.

**UNIT-III: SECURITY MODELS AND VIRTUAL PRIVATE DATABASES (11 periods)**

**Database Application Security Models:** Introduction, Types of Users, Security Models, Application Types, Application Security Models.

**Virtual Private Databases:** Introduction, Overview of VPD, Implementing VPDs, Implementing Oracle VPD, Viewing VPD Policies and Application Context Using the Data Dictionary and Policy Manager, Implementing Row-and Column level Security with SQL Server .

**UNIT-IV: DATABASE SECURITY DESIGN**

**Secure DBMS Design:** Introduction, Security mechanisms in DBMSs, Secure DBMS architectures.

**Design of Secure Databases:** Preliminary Analysis, Requirement Analysis and Security Policy Selection, Conceptual Design, Logical Design, Physical Design, Implementation of Security Mechanisms, Verification and Testing.

**UNIT-V: DATA AUDITING AND AUDITING DATABASE ACTIVITIES (10 periods)**

**Application Data Auditing:** Introduction, DML Action Auditing Architecture, Oracle Triggers, SQL Server Triggers, Fine-grained Auditing with Oracle, DML Statement Audit Trail, Auditing Application Errors with Oracle.

**Auditing Database Activities:** Using Oracle Database Activities, Creating DLL Triggers with Oracle, Auditing Database Activities with Oracle, Auditing Server Activity with Microsoft SQL Server 2000, Implementing AQL Profiler, Security Auditing with SQL Server, SQL Injection

**Total Periods: 54**

**TEXT BOOKS:**

1. Hassan A. Afyouni, "Database Security and Auditing: Protecting Data Integrity and Accessibility," CENGAGE Learning, New Delhi, 2006.
2. S. Castano, M. Fugini, G. Martella, P. Samarati, "Database Security," Addison-Wesley, New York, 1994

**REFERENCE BOOKS:**

1. Ron Ben Natan, "Implementing Database Security and Auditing," U.S.A: Elsevier Digital Press, 2005.
2. Michael Gertz, SushilJajodia, "Handbook of Database Security: Applications and Trends," New York: Springer, 2008.

## **SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

**Department of Computer Science and Engineering**

**I M. Tech (CN&IS). II-Semester**

**(16MT26306)SOCIAL NETWORKS**

**(Professional Elective-2)**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>40</b>	<b>60</b>	<b>100</b>	<b>4</b>	<b>--</b>	<b>--</b>	<b>4</b>

### **PRE-REQUISITES:**

A Course on "Computer Networks"

### **COURSE DESCRIPTION:**

Concepts of Tweet rank model; Rich Media Communications patterns; Data Pre-Processing; Challenges of DOSN; Web accessibility analysis; Collaborative tagging; Visualization and Applications of Social Networks

### **COURSE OUTCOMES:**

CO1: Gain knowledge on

- Social Media Analysis
- Mining and Privacy.
- Visualization and Applications of Social Networks.

CO2: Analyze the mining techniques, social network Infrastructures and Communities.

CO3: Apply the Baye's Conditional Probabilities technique in the real world applications of social networks.

CO4: Initiate research to identify solutions for security and privacy in social networks.

CO4: Develop effective communication among peers in the area of Social Networks.

CO5: Acquire professional code of conduct and social responsibility to contribute for development of society.

### **DETAILED SYLLABUS:**

#### **UNIT I Social Media Analysis and Organization (10 periods)**

Social Network Analysis: History, Concepts, and Research, Analysis of Social Networks by Tensor Decomposition, Analyzing the Dynamics of Communication in Online Social Networks, Qualitative Analysis of Commercial Social Network Profiles.

#### **UNIT II Social Media Mining and Search (11 periods)**

Discovering Mobile Social Networks by Semantic Technologies, Online Identities and Social Networking, Detecting Communities in Social Networks, Concept Discovery in Youtube.com Using Factorization Method, Discovering Communities from Social Networks: Methodologies and Applications

#### **UNIT III Social Network Infrastructures and Communities**

**(11 periods)**

Decentralized Online Social Networks, Multi-Relational Characterization of Dynamic Social Network Communities, Accessibility Testing of Social Websites, Understanding and Predicting Human Behavior for Social Communities

**UNIT IV Privacy in Online Social Networks (11 periods)**

Managing Trust in Online Social Networks, Security and Privacy in Online Social Networks, Investigation of Key-Player Problem in Terrorist Networks Using Bayes Conditional Probability, Security Requirements for Social Networks in Web 2.0

**UNIT V Visualization and Applications of Social Networks**

**(12 periods)**

Visualization of Social Networks, Novel Visualizations and Interactions for Social Networks Exploration, Applications of Social Network Analysis, Online Advertising in Social Networks

**Total Periods: 55**

**TEXT BOOK:**

1. Borko Furht, "Handbook of Social Network Technologies and Applications", 1ed, Springer, 2010.

**REFERENCE BOOKS:**

1. Peter Mika, "Social Networks and the Semantic Web", 1ed, Springer, 2007
2. John Lovett, "Social Media Metrics Secrets", Wiley India Private Limited, 2011.

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

**Department of Computer Science and Engineering**

**I M. Tech (CN&IS) – II Semester**

**(16MT20531) CLOUD COMPUTING & BIG DATA ANALYTICS LAB**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>50</b>	<b>50</b>	<b>100</b>	<b>--</b>	<b>--</b>	<b>4</b>	<b>2</b>

**PRE-REQUISITES:**

Course on "Cloud Computing" and "Operating Systems"

**COURSE DESCRIPTION:**

Hands-on experience on creating Virtual machines on Windows and Linux platforms, Development of Service based web applications & their deployment and Mobile app development, Designing and implementing Hadoop cluster.

**COURSE OUTCOMES:**

*After successful completion of this course , students will be able to:*

- CO1: Demonstrate hands-on experience on Virtualization models, Cloud Environment and Hadoop cluster setup.
- CO2: Analyze the given experiment and measure the performance of services and datasets.
- CO3: Apply API development skills in web applications for Cloud deployment and develop solutions for real time applications using Hadoop.
- CO4: Devise virtual environments based on virtualization techniques and processing huge amount of data using Big data tools
- CO5: Develop written and oral communications in preparing and presenting reports.

**LIST OF PRACTICAL EXERCISES:**

1. Create Virtual machines with given set of configuration on Hyper-V," Ubuntu 14 LTS OS, with 2 GB RAM and 200 GB HDD". (IaaS)
2. Create Virtual machines with given set of configuration on Ubuntu OS: "Windows 7 OS with 4 GB RAM and 500 GB HDD". (IaaS)
3. Develop a Design document for a web application, to perform operations based on service calls and to be deployed on cloud environment. (Design Doc)
4. Develop a web application for performing Calculator operations by selecting relevant services. Deploy it on cloud platform. (SaaS)
5. Develop a HTTPS web application with social media interfaces (Facebook / Twitter / Instagram / Google+ APIs). (SaaS)
6. Develop a mobile app on Google App Engine for uploading a resume into a website, collaborated with Drop box. The resume should be encrypted. (PaaS)
7. Develop a service call to run on Drop box resumes for picking the resumes of given skill set. (PaaS)

- a. 6+ years of Exp in Java Development.
  - b. 10 years of experience in Automation Testing.
  - c. 15+ years of Managerial experience with technical background.
  - d. 5-7 years of on-site experience in .NET support and programming.
8. Install and run Hadoop using Single node Cluster.
  9. Install and run Hadoop using Multi node cluster
  10. Write a program to count words in a program using map and reduce functions and Hadoop.
  11. Illustrate installation and configuring of Hive.

**REFERENCE BOOKS:**

- 1: Ivanka Menken and Ivanka Menken, "*Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book*," 1ed, Emereo Pty. Ltd., 2009.
- 2: Barrie Sosinsky, "*Cloud Computing Bible*," 1ed, Wiley India Pvt Ltd, 2011.
- 3: Tom White, "*Hadoop: The Definitive Guide*," 3ed, O'REILLY Publications, 2012.



**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**

Department of Computer Science and Engineering

I M. Tech. (CN&amp;IS) -II Semester

**(16MT26331) WIRELESS NETWORKS LAB**

<b>Int. Marks</b>	<b>Ext. Marks</b>	<b>Total Marks</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>50</b>	<b>50</b>	<b>100</b>	<b>-</b>	<b>-</b>	<b>4</b>	<b>2</b>

**COURSE DESCRIPTION:**

This course introduces hands-on experience in designing and implementing wireless networking models.

**COURSE OUTCOMES:**

On successful completion of this course the students will be able to:

CO1. Gain practical knowledge on wireless network simulation.

CO2. Analyze performance measures of multi-hop wireless network models.

CO3. Design wireless networking models and validate networking protocols.

CO4. Compare and Contrast performance measures of new networking models.

CO5. Develop simulation models for wireless networking by using QUALNET.

**List of Exercises in Wireless Networks:**

<b>Exercise Number</b>	<b>Description</b>	<b>No. of Slots required</b>
1	Consider a Wireless channel with data rate 2Mbps and transmit data more than the channel capacity. Simulate TCP-SACK (Selective Acknowledgement Protocol) Protocol to retransmit the lost packets.	2
2	Given a wireless network with four channels, each with a frequency of 2.4Ghz, simulate ALOHA multiple access technique to access the channels.	1
3	The maximum achievable throughput in the aloha protocol is low because of more number of collisions. Simulate Carrier Sense Multiple Access (CSMA) Protocol to reduce the number of collisions.	1

**Table-1**

<b>PARAMETER</b>	<b>VALUE</b>
Simulation time	60 Sec
Simulation area	700m X 700m
Maximum number of packets	50
Packet rate	5 packets/sec
Traffic size	CBR
Number of channels	3
Node movement model	Random Way Point

Number of nodes	15
Mobility of nodes	Yes
Network interface type	Wireless
MAC type	802.11
Bandwidth	10 Mbps

- |   |   |   |
|---|---|---|
| 4 | Design a scenario using the a parameters given in table 1, Simulate Destination Sequenced Distance Vector (DSDV) Routing Algorithm for AdHoc Networks, and analyze the metrics throughput, average end to end delay, packet delivery ratio, jitter by changing the number of channels, maximum number of packets, packet rate, IPV6 and number of nodes.    | 2 |
| 5 | Design a scenario using the parameters given in table 1, Simulate Ad Hoc on Demand Distance Vector (AODV) Routing Algorithm for AdHoc Networks, and analyze the metrics throughput, average end to end delay, packet delivery ratio, jitter by changing the number of channels, maximum number of packets, packet rate,IPV6, and number of nodes.           | 1 |
| 6 | Design a scenario using the parameters given in table 1, Simulate Zone Routing Protocol(ZRP) Algorithm for AdHoc Networks, and analyze the metrics throughput, average end to end delay, packet delivery ratio, jitter by changing the number of channels, maximum number of packets, packet rate,IPV6, and number of nodes.                                | 1 |
| 7 | Design a scenario using the parameters given in table 1, Simulate Wireless Routing Protocol(WRP),a path finding algorithm for AdHoc Networks. Analyze the metrics throughput, average end to end delay, packet delivery ratio, jitter by changing the number of channels, maximum number of packets, packet rate, control overhead,IPV6and number of nodes. | 1 |
| 8 | Design a scenario using the parameters given in table 1, Simulate Fisheye Source Routing(FSR) ProtocolforAdHoc Networks, which divide each node's neighborhood to blurred zones so that the information details and accuracy is better for nodes to be nearer. Analyze the metrics throughput, average end to end delay, packet delivery ratio, jitter by   | 1 |

- changing the number of channels, maximum number of packets, packet rate, control overhead, IPV6, and number of nodes.
- 9 Design a scenario using the parameters given in table 1, Simulate Clusterhead Gateway Switch Routing(CGSR) a multi-channel operation Protocol for AdHoc Networks. Analyze the metrics throughput, average end to end delay, packet delivery ratio, jitter by changing the number of channels, maximum number of packets, packet rate, control overhead, IPV6, and number of nodes. 1

**Table-2**

PARAMETER	VALUE
Simulation time	60 Sec
Simulation area	700m X 700m
Maximum number of packets	50
Packet rate	5 packets/sec
Traffic size	CBR
Number of channels	3
Node movement model	Random Way Point
Number of nodes	15
Mobility of nodes	Yes
Network interface type	Wireless
MAC type	802.16
Bandwidth	10 Mbps

- 10 Design a point-to-multipoint broadband wireless access scenario using the parameters given in table 2. Simulate WiMax IEEE 802.16 technology for wireless metropolitan area networks, and analyze the metrics throughput, average end to end delay, packet delivery ratio, jitter by changing the number of channels, maximum number of packets, packet rate, IPV6 and number of nodes. 1

**REFERENCE BOOKS:**

- 1.Dharma Prakash Agarwal, Qing-AnZeng, "Introduction to Wireless & Mobile systems," Cengage Learning, Fourth edition, 2016.
2. Theodore S. Rappaport, "Wireless Communications–Principles and Practice,"2ed, PHI, 2002

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**I M. Tech. (CN&IS)-II Semester**  
**(16MT26332) SEMINAR**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
--	100	100	--	--	--	2

**PRE-REQUISITES:--**

**COURSE DESCRIPTION:**

Identification of seminar topic; literature survey; preparation of technical report and presentation:

**COURSE OUTCOMES:**

On successful completion of this course, the students will be able to

- CO1. Demonstrate capacity to identify an advanced topic for seminar in core and allied areas.
- CO2. Extract information pertinent to the topic through literature survey.
- CO3. Comprehend extracted information through analysis and synthesis critically on the topic.
- CO4. Plan, organize, prepare and present effective written and oral technical report on the topic.
- CO5. Adapt to independent and reflective learning for sustainable professional growth in Computer networks & information Security.
- CO6. Contribute to multidisciplinary scientific work in the field of Computer networks & information Security
- CO7. Understand ethical responsibility towards environment and society in the field of Computer networks & information Security.
- CO8. Engage in lifelong learning for development of technical competence in the field of Computer Networks & information Security

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**M. Tech. – II Semester (CN&IS)**  
**(16MT23810) INTELLECTUAL PROPERTY RIGHTS**  
**(Common to all M. Tech. Programs)**  
**(Audit Course)**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
-	-	-	-	2	-	-

**PRE-REQUISITES: --**

**COURSE DESCRIPTION:**

Introduction to Intellectual Property; Trade Marks; Law of Copy Rights; Law of Patents; Trade Secrets; Unfair Competition; New Development of Intellectual Property.

**COURSE OUTCOMES:**

After successful completion of the course, students will be able to:

CO1. Demonstrate in-depth knowledge on

- Intellectual Property
- Trade Marks & Secrets
- Law of Copy Rights, Patents
- New development of Intellectual Property

CO2. Analyze the different forms of infringement of intellectual property rights.

CO3. Solve problems pertaining to Intellectual Property Rights.

CO4. Stimulate research zeal for patenting of an idea or product.

CO5. Write effective reports required for filing patents.

CO6. Develop life-long learning capabilities.

CO7. Develop awareness of the relevance and impact of IP Law on their academic and professional lives.

CO8. Develop attitude for reflective learning.

**DETAILED SYLLABUS:**

**UNIT - I: Introduction to Intellectual property (Periods: 5)**

Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

**UNIT - II: Trade Marks: (Periods: 5)**

Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

**UNIT - III: Law of copy rights: (Periods: 6)**

Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law.

**Law of patents:** Foundation of patent law, patent searching process, ownership rights and transfer

**UNIT - IV: Trade Secrets:****(Periods: 6)**

Trade secret law, determination of trade secret status, liability for misappropriations of trade secrets, protection for submission, trade secret litigation.

**Unfair competition:** Misappropriation right of publicity, False advertising.

**UNIT - V: New development of intellectual property:****(Periods: 6)**

New developments in trade mark law; copy right law, patent law, intellectual property audits.

International overview on intellectual property, international - trade mark law, copy right law, international patent law, international development in trade secrets law.

**Total Periods: 28****REFERENCE BOOKS:**

1. Deborah, E. Bouchoux, *Intellectual property right*, Cengage learning.
2. Prabuddha Ganguli, *Intellectual property right - Unleashing the knowledge economy*, Tata McGraw Hill Publishing Company Ltd

**SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)**  
**Department of Computer Science and Engineering**  
**M. Tech. (CNIS)-III & IV Semesters**  
**(16MT36331 &16MT46331) PROJECT WORK**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
200	200	400	--	--	--	28

**PRE-REQUISITES: --**

**COURSE DESCRIPTION:**

Identification of topic for the project work; Literature survey; Collection of preliminary data; Identification of implementation tools and methodologies; Performing critical study and analysis of the topic identified; Time and cost analysis; Implementation of the project work; Writing of thesis and presentation.

**COURSE OUTCOMES:**

*On successful completion of this course, the students will be able to:*

- CO1. Demonstrate capacity to identify an advanced topic for project work in core and allied areas.
- CO2. Extract information pertinent to the topic through literature survey.
- CO3. Comprehend extracted information through analysis and synthesis critically on the topic.
- CO4. Solve engineering problems pertinent to the chosen topic for feasible solutions.
- CO5. Use the techniques, skills and modern engineering tools necessary for project work.
- CO6. Do time and cost analysis on the project.
- CO7. Plan, prepare and present effective written and oral technical report on the topic.
- CO8. Adapt to independent and reflective learning for sustainable professional growth.
- CO9. Contribute to multidisciplinary scientific working the field of Computer Networks & Information Security
- CO10. Understand ethical responsibility towards environment and society in the field of Computer Networks & Information Security.
- CO11. Engage lifelong learning for development of technical competence in the field of Computer Networks & Information Security.