AISSMS
INSTITUTE OF INFORMATION TECHNOLOGY
(I.O.I.T)
ADDING VALUE TO ENGINEERING

An Autonomous Institute Affiliated to Savitribai Phule Pune University
Approved by AICTE, New Delhi and Recognised by Govt. of Maharashtra
Accredited by NAAC with "A+" Grade | NBA - 5 UG Programmes

Program - ELECTRONICS AND TELECOMMUNICATION ENGINEERING

M. Tech. (VLSI & Embedded Systems)
Curriculum Structure and Detailed Syllabus (PG Program)

Second Year M.TECH
(Applicable for the batches admitted from A. Y.: 2024-25)

AISSMS INSTITUTE OF INFORMATIONTECHNOLOGY
Kennedy Road, Near RTO,
Pune – 411 001, Maharashtra State, India
Email: principal@aissmsioit.org ,
Website: https://aissmsioit.org/

Institute Vision & Mission

Vision

To be recognized amongst top 10 private engineering colleges in Maharashtra by the year 2026 by rendering value added education through academic excellence, research, entrepreneurial attitude, and global exposure.

Mission

- To enable placement of 150 plus students in the 7 lacs plus category &ensure 100% placement of all final year students
- To connect with 10 plus international universities, professional bodiesand organizations to provide global exposure to students
- To create conducive environment for career growth, prosperity, and happiness of 100% staff.
- To be amongst top 5 private colleges in Pune in terms of admission cut off.

Quality Policy

We commit ourselves to provide quality education & enhance our students quality through continuous improvement in our teaching and learning processes.

Department Vision & Mission

Vision

To be one of the renowned Electronics & Telecommunication Engineering programmes imparting quality education by promoting professionalism, values, and ethics leading to a progressive career in industry & academia globally.

Mission

- To boost employability/entrepreneurship/higher studies through value-added activities.
- To inculcate research attitude and professional ethics for addressing the needs of industry.

Program Educational Objectives(PEOs)

Graduates will

1. Engage in solving problems in the E&TC domain by developing products/offering services to cater to the needs of the society.
2. Work in diverse career fields of information and communication technology.
3. Develop new methodologies and technologies for solving real-life problems

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Program Outcomes (POs)

1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. [Engineering knowledge]

2. Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. [Problem analysis]

3. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. [Design/development of solutions]

4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. [Conduct investigations of complex problems]

5. Create, select, and apply appropriate techniques, resources, and modern engineering andIT tools including prediction and modelling to complex engineering activities with an understanding of the limitations. [Modern tool usage]

6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice. [The engineer and society]

7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. [Environment and sustainability]

8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. [Ethics]

9. Function effectively as an individual, and as a member or leader in diverse teams, andin multidisciplinary settings. [Individual and team work]

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

11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. [Project management and finance]

12. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. [Life-long learning]

Program Specific Outcomes (PSOs)

Graduates will be able to

1. Apply domain-specific knowledge to analyze, design and develop electronics and telecommunication systems/applications in the field of Embedded Systems, Very Large Scale Integration (VLSI), Internet of Things (IoT), and Communication Technology.

2. Select and apply software and hardware tools such as Electronic Design Automation (EDA) and Test/Measurement equipment to solve engineering problems.

M. Tech. (VLSI & Embedded Systems) – Second Year (Semester–III)

Sr. No.	Code	Course Title	Hours per week			Credits	Examination scheme				
			L	T	P		Unit Test	End Sem	TW	OR/ Presentation	Total
1	VLVSE1101	Internship	--	--	24	12	--	--	100$$	--	100
2	VLHSM1102	Project and Finance Management MOOCs	02	--	--	02	--	--	50$	--	50
3	VLHSM1103	Intellectual Property Rights MOOCs	02	--	--	02	--	--	50$	--	50
4	VLELC1104	Project Stage I @@	--	--	08	04	--	--	50	50	100
		Total	04	--	32	20	--	--	250	50	300

L-Lecture, T-Tutorial, P-Practical

$ Assignments marks will be converted on the scale of 25 marks. Score of examination conducted by the respective authority of MOOC or Score of ESE Conducted by Institute will be converted on the scale of 25 marks.

$$ Internship to be undertaken in 3rd Semester. Necessary proofs and documents are to be maintained by the student and department. Work to be evaluated by the concerned staff. Students should present to the peers and department the work undertaken and submit a report and Comprehensive Viva Voce.

Note: @@ Passing is mandatory in both the examination heads to gain total Course Credits.

MOOC:
Project and Finance Management (8 Weeks) : https://onlinecourses.nptel.ac.in/noc24_mg78/preview
Intellectual Property Rights (8 Weeks): https://onlinecourses.nptel.ac.in/noc24_mg135/preview

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M. Tech. (VLSI & Embedded Systems) – Second Year (Semester –IV)

Sr. No.	Code	Course Title	Hours per week			Credits	Examination scheme				
			L	T	P		Unit Test	End Sem	TW	OR/ Presentation	Total
1	VLHSM1201	Technical Paper Writing @@	--	02	--	02	--	--	50	50	100
2	VLELC1202	Project Work Stage II @@	--	--	28	14	--	--	150	50	200
3	VLHSM1203	Introduction to Cyber Security :MOOCs	--	03	02	04	--	--	50$	--	50
		Total	--	05	30	20	--	--	250	100	350

L-Lecture, T-Tutorial, P-Practical

$ Assignments marks will be converted on the scale of 25 marks. Score of examination conducted by the respective authority of MOOC or Score of ESE Conducted by Institute will be converted on the scale of 25 marks.

MOOC:

Introduction to Cyber Security: (8 Weeks): https://onlinecourses.nptel.ac.in/noc24_cs121/preview

Note: @@ Passing is mandatory in both the examination heads to gain total Course Credits.

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M. Tech Second Year Electronics and Telecommunications (2024 Course)

Internship

Course Code:	VLVSE1101	Credit		12
Contact Hours:	24 Hrs./week (P)	Type of Course:		Practical
Examination Scheme	Term-work 100 marks			

Course assessment methods/tools:

Sr. No.	Course assessment methods/tools	External/ Internal	Marks
1.	Term work Evaluation	Internal	100

Course Objectives	
1	Exposure to the industrial environment, which cannot be simulated in the classroom and hence creating competent professionals for the industry.
2	Provide possible opportunities to learn understand and sharpen the real time technical / managerial skills required at the job.
3	Exposure to the current technological developments relevant to the subject area of training.
4	Expose students to the engineer's responsibilities and ethics.

Course Outcomes: Students will be able to	
1101.1	Understand workplace dynamics, professional expectations, and the influence of culture on both.
1101.2	Build proficiency in a range of business or industry skills appropriate to the field of the internship placement, including professional and inter-cultural communication through written, verbal, and non-verbal means.
1101.3	Refine and clarify professional and career goals through critical analysis of the internship experience or research project.
1101.4	Create conducive conditions with quest for knowledge and its applicability on the job.
1101.5	Understand the social, environmental, economic and administrative considerations that influence the working environment.

Topics covered:

Internships are educational and career development opportunities, providing practical experience in a field or discipline. They are structured, short-term, supervised placements often focused around particular tasks or projects with defined timescales. An internship may be compensated or non-compensated by the organization providing the internship. The internship has to be meaningful and mutually beneficial to the intern and the organization. It is important that the objectives and the activities of the internship program are clearly defined and understood.

The internship offers the students an opportunity to gain hands-on industrial or organizational exposure; to integrate the knowledge and skills acquired through the coursework; interact with professionals and other interns; and to improve their presentation, writing, and communication skills. Internship often acts as a gateway for final placement for many students. A student shall opt for carrying out the Internship at an Industry/Research Organization or at another institute of higher learning and repute (Academia). The organization for Internship shall be selected/decided by the students on their own with prior approval from the faculty advisor/respective PG Programme Coordinator/Guide/Supervisor. Every student shall be assigned an internship Supervisor/Guide at the beginning of the Internship. The training shall be related to their specialization after the second semester for a minimum duration of six to eight weeks. On completion of the course, the student is expected to be able to develop skills in facing and solving the problems experiencing in the related field.

Types of Internships :

- Industry Internship with/without Stipend
- Govt / PSU Internship (BARC/Railway/ISRO etc)
- Internship with prominent education/research Institutes Ø Internship with Incubation centres /Start-ups

Guidelines :

- All the students need to go for internship for minimum duration of 6 to 8 weeks.
- Students can take mini projects, assignments, case studies by discussing it with concerned authority from industry and can work on it during internship.
- All students should compulsorily follow the rules and regulations as laid by industry.
- Every student should take prior permissions from concerned industrial authority if they want to use any drawings, photographs or any other document from industry.
- Student should follow all ethical practices and SOP of industry.
- Students have to take necessary health and safety precautions as laid by the industry.
- Student should contact his /her Guide/Supervisor from college on weekly basis to communicate the progress.
- Each student has to maintain a diary/log book
- After completion of internship, students are required to submit   .
  Report of work done, Internship certificate copy, Feedback from employer / internship mentor, Stipend proof (in case of paid internship).

Total Marks 100: The marks awarded for the Internship will be on the basis of (i) Evaluation done by the Industry (ii) Students diary (iii) Internship Report and (iv) Comprehensive Viva Voce.

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M. Tech Second Year Electronics and Telecommunications (2024 Course)

Project and Finance Management

Course Code:	VLHSM 1102	Credit		2
Contact Hours:	2 Hrs./week (L)	Type of Course:		Lecture
Examination Scheme	Term-work 50 marks			

Course assessment methods/tools:

Sr. No.	Course assessment methods/tools	External/ Internal	Marks
1.	Term work Evaluation	Internal	50

Course Objectives

1	To explain the key concepts and principles of project management.
2	Enable students to utilize project scheduling tools such as Gantt charts and critical path method (CPM) for project planning.
3	To train students to allocate resources effectively based on project requirements and constraints.
4	To teach students to utilize progress monitoring techniques to track project performance.
5	To train students to identify potential risks associated with project execution.
6	Prepare students to analyze project budgets and financial statements to make informed decisions.

Course Outcomes: Students will be able to

1102.1	Define project management terminology and concepts.
1102.2	Develop a project schedule using Gantt charts and critical path analysis.
1102.3	Assess resource requirements and allocation strategies for a project.
1102.4	Formulate risk management plans for identified project risks.
1102.5	Apply financial planning techniques to develop project budgets.
1102.6	Develop a comprehensive financial plan for a given project proposal.

Module I: Introduction to Project Management (4 hrs.)
Definition and importance of project management, Project lifecycle and phases, Key stakeholders and their roles, Identify project objectives and scope, Feasibility analysis, Project charter development.

Module II: Project Planning (4 hrs.)
Work Breakdown Structure (WBS), Creating WBS, Task identification and sequencing, Estimation techniques (PERT, CPM), Resource identification and allocation, Resource leveling and optimization, Cost estimation and budgeting.

Module III: Project Scheduling (4 hrs.)
Basics of Gantt charts, Scheduling tasks and milestones, Critical Path Method (CPM), Identifying project risks, Risk assessment and mitigation strategies, Contingency planning.

Module IV: Project Execution and Monitoring (4 hrs.)
Building effective project teams, Leadership and motivation, Conflict resolution, Progress monitoring techniques, Earned Value Management (EVM), Change management processes.

Module V: Project Closure (4 hrs.)
Conducting project post-mortems, Lessons learned documentation, Client acceptance and sign-off, Transition and Handover, Deliverables handover, Knowledge transfer, Project closure documentation.

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> **Module VI: Finance Management (4 hrs.)**
> Financial Planning and Analysis, Budgeting and forecasting, Financial metrics and KPIs, Cost-benefit analysis, Funding and Investment Analysis, Capital budgeting techniques, Financing options (equity, debt, grants), Investment appraisal methods.

Text Books:
1. K. Nagarajan, "Project Management", 5th Edition, New Age International Publishers, 2010.Reference Books:
2. Prasanna Chandra, "Projects: planning, analysis, selection, implementation and review", 4th Edition, Tata McGraw Hill Publishing Co. Ltd, New Delhi, 1995.
3. Rosy Burke, "Project Management: planning and control technique", Wiley India, 2003
4. S. Chaudhary, "Project Management", Tata McGraw Hill, 1988.

Reference Books:

1. J. R. Meredith, S. J. Mantel, "Project Management: A managerial approach", Wiley India, 2010.
2. John M. Nicholas, Herman Steyn, "Project Management", 3rd Edition, Elsevier Inc., 2008.
3. Samuel Mantel, Jr. J. R. Meredith, S. M. Scafer, M. M. Sutton, M. R. Copalan, "Project Management" 1st Edition, 2011.
4. Financial Management for Engineers" by Lawrence H. Van Vlancker.

E- Books / E- Learning References: https://onlinecourses.nptel.ac.in/noc24_mg78/preview

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M. Tech Second Year Electronics and Telecommunications (2024 Course)

Intellectual Property Rights

Course Code:	VLHSM 1103	Credit	2
Contact Hours:	2 Hrs/week (L)	Type of Course:	Lecture
Examination Scheme	Term-work 50 marks		

Course assessment methods/tools:

Sr. No.	Course assessment methods/tools	External/ Internal	Marks
1.	Term work Evaluation	Internal	50

Course Objectives

1	Different laws related to IPR and Patent
2	Concepts like goodwill, copyright, trademark , brand
3	Concept of patent standards
4	Different types of patents

Course Outcomes: Students will be able to

1103.1	Define intellectual property and distinguish between different types of IPR with legal requirements.
1103.2	Describe laws of IPR in different countries and international.

Topics covered:

Module I: Introduction (4 hrs.)
Intellectual property, History, Types (Seven types of Intellectual Property Rights) viz.
Patent, Industrial Designs, Trademark, Copyright, Geographical Indication, Integrated Circuit Layout, Trade Secrets.

Module II: Patents and Standards (4 hrs.)
Review of Patents and standards: History of patent law, History of Indian Patent System, Utility model Procedures: Patent application, Patent infringement and enforcement, Patent licensing, Patent prosecution. Criteria of patentability, Rights granted for IP owners.

Module III: Legal and other Aspects (4 hrs.)
Legal requirements: Patentable subject matter, Novelty, Utility (Patent), Inventive step and non-obviousness, Industrial applicability, Person skilled in the art, Prior art, Inventor ship, Sufficiency of disclosure, Unity of invention, Intellectual property brokering, Intellectual property education, Intellectual property infringement, Intellectual property valuation.

Module IV: Policy and Guidelines (4 hrs.)
CEN and CENELEC Patent Policy, CEN-CENELEC Guidelines for Implementation of the Common IPR Policy on Patents, Declaration of patents. Copyright: CEN-CENELEC copyright policy, piracy. Industrial design rights, Trademarks: Geographical indication, Protected designation of origin, Trade dress.

Module V: Regional Patent Laws (4 hrs.)
Patent law by region or country: Indian patent law, Australian patent law, Canadian patent law, Patent law of the People's Republic of China, European patent law, Japanese patent law, United States patent law.

Module VI: Miscellaneous Topics (4 hrs.)
Database right, Fashion law, Indigenous intellectual property, Industrial design rights (or registered designs), Intellectual rights to magic methods, Internet domain name, Know how, Mask work (or Integrated circuit layout design protection), Open-source software, Orphan drug rights, Personality rights, Plant breeders' rights.

Text Books:
1. Intellectual Property Rights – Prabuddha Ganguli, Tata McGraw Hill publishing Company Ltd.
2. Satarkar S.V., Intellectual Property Rights and Copy Right. ESS Publications.

References:
1. http://ipindia.nic.in/
2. http://ipindia.nic.in/ipr/patent/patents.htm
3. http://www.ipaustralia.gov.au/ (Australian Intellectual property)
4. http://guides.slv.vic.gov.au/
5. http://www.cipo.ic.gc.ca (Canadian patent office)
6. http://www.epo.org(Europian patent office)
7. http://www.academicleadership.org/emprical_research/The_State_of_Intellectual_Property_Education_Worldwide.shtml (Intellectual property education)

E- Books / E- Learning References: https://onlinecourses.nptel.ac.in/noc24_cs121/preview

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M. Tech Second Year Electronics and Telecommunications (2024 Course)

Project Stage I

Course Code:	VLELC 1104	Credit		4
Contact Hours:	8 Hrs./week (P)	Type of Course:	Practical	
Examination Scheme	Term-work 50 marks	Oral/Presentation 50 marks		

Course assessment methods/tools:

Sr. No.	Course assessment methods/tools	External/ Internal	Marks
1.	In-Sem. Evaluation	Internal	40
2.	End Semester Examination	External	60

Course Objectives

1	Provide an opportunity to learn new software, interdisciplinary theory, concepts and technology.
2	Empower students to use engineering knowledge and skills learned in previous courses to deliver a product that has passed through the design, analysis, testing, and evaluation.
3	Encourage multidisciplinary project work through the integration of knowledge.
4	Allow students to develop problem-solving, analysis, synthesis, and evaluation skills.
5	Improve students' communication skills by asking them to produce both a professional report and to give an oral presentation.

Course Outcomes: Students will be able to

1104.1	Define the project problem statement and identify the scope of the project.
1104.2	Search the appropriate research papers, standards and e-resources and write a literature survey.
1104.3	Identify tools, techniques, methods, concepts, measuring devices, and instruments required for the project to define the methodology of the project.
1104.4	Justify the selection of electrical, electronic and mechanical components for the project prototyping.
1104.5	Simulate or develop a system for software or hardware verification.
1104.6	Write a project report with proper interpretation of results.

Topics covered:

Project Stage–I is an integral part of the project work. In this, the student shall complete the partial work of the project which will consist of problem statement, literature review, project overview, scheme of implementation (Mathematical Model/block diagram/ PERT chart, etc.) simulation model, Layout & Design of the Set-up and results if obtained.

As a part of the progress report of Project Stage-I, the student shall deliver a presentation on the advancement in Technology pertaining to the selected dissertation topic. The project stage I is the progress presentation of dissertation work. The student should clearly present different stages in which dissertation work is to be completed, giving planning of the remaining part to be completed in Project Stage-II. Publication based on the work is desirable in the proceedings of reputed and reviewed conferences.

A guide should maintain record of discussion related to the topic, work carried out by the student. The student shall submit the duly certified progress report of Project work Stage-I in standard format for satisfactory completion of the work by the concerned guide and head of the Program / Institute.

M. Tech. (VLSI & Embedded Systems) – Second Year (Semester –IV)

M. Tech Second Year Electronics and Telecommunications (2024 Course)

Technical Paper Writing

Course Code:	VLHSM 1201	Credit	2
Contact Hours:	2 Hrs./week (T)	Type of Course:	Tutorial
Examination Scheme	Term-work 50 marks	Oral/Presentation 50 marks	

Course assessment methods/tools:

Sr. No.	Course assessment methods/tools	External/ Internal	Marks
1.	Termwork Evaluation	Internal	50
2.	Oral/Presentation Examination	External	50

Course Objectives

1	Equip students with knowledge of the various types and structures of technical papers, specifically within the field of Power Electronics and Drives.
2	Enable students to conduct thorough literature reviews, design robust research methodologies, and understand the ethical considerations in research and publication.
3	Train students to present complex technical data clearly and effectively through well-structured papers, including appropriate use of tables, graphs, and charts.
4	Teach students to critically analyze research results, compare findings with existing literature, and articulate the significance and limitations of their research.
5	Provide students with the skills necessary to prepare, submit, and revise manuscripts according to journal guidelines and respond to peer review comments.
6	Prepare students to present their research findings in written and oral formats, suitable for academic conferences and professional gatherings.

Course Outcomes: Students will be able to

1201.1	Write well-structured technical papers, including clear and concise abstracts, introductions, methodologies, results, discussions, and conclusions.
1201.2	Demonstrate the ability to conduct comprehensive literature reviews and manage references using appropriate tools like EndNote, Mendeley, or Zotero.
1201.3	Proficient in presenting experimental data and research findings through effective use of tables, graphs, and charts, utilizing software tools such as MATLAB and Excel.
1201.4	Critically analyze research findings, address limitations, and propose future research directions in their discussion sections.
1201.5	Gain practical experience in preparing manuscripts for submission to peer-reviewed journals, including formatting, writing cover letters, and navigating the peer review process.
1201.6	Effectively communicate their research findings both in written papers and oral presentations, suitable for academic and professional settings.

Topics covered:

Module I: Introduction to Technical Writing (4 hrs.)
Types and purposes of technical papers, Structure and components of a technical paper (abstract, introduction, methodology, results, discussion, conclusion), Reading and analyzing exemplary technical papers in Power Electronics and Drives, Defining research questions and objectives, Literature review techniques, Research methodologies in Power Electronics and Drives, Ethical considerations in research and publication.

Module II: Planning and Structuring of Technical Paper (4 hrs.)
Identifying your audience and journal selection, Outlining your paper, Drafting a research proposal Writing the Introduction and Literature Review: Crafting a compelling introduction, Conducting and writing a literature review, Citing sources and managing references (using tools like EndNote, Mendeley, or Zotero).

Module III: Presenting Research Methodology and Results (4 hrs.)
Methodology Section: Detailing experimental setups, simulations, and procedures, Ensuring reproducibility and clarity. Results and Data Presentation: Presenting data effectively (tables, graphs, and charts), Using appropriate software tools for data visualization (MATLAB, Excel, etc.).

Module IV: Discussion, Conclusion, and Abstract Writing (4 hrs.)
Interpreting results and comparing with existing research, Addressing limitations and suggesting future work. Writing Conclusions and Abstracts: Summarizing key findings succinctly, Writing a clear and concise abstract, Keywords selection.

Module V: Manuscript Preparation and Peer Review Process (4 hrs.)
Formatting according to journal guidelines, Writing cover letters, Understanding the peer review process, Responding to reviewer comments and revising your paper.

Module VI: Advanced Topics and Practical Sessions (5 hrs.)
Writing for grants and proposals, Communicating complex ideas clearly and effectively, Peer review and feedback sessions, Finalizing and submitting a draft paper, Tips for oral presentations and conference papers.

Assessment and Evaluation:
- Weekly writing assignments and practical exercises.
- Peer review feedback sessions.
- Drafting a complete section of a technical paper (e.g., methodology or results).
- Submission of a full technical paper draft.
- Presentation of research findings.

Text Books:
1. Technical Writing for Engineers & Scientists by Leo Finkelstein.
2. Writing for Science and Engineering: Papers, Presentations and Reports" by Heather Silyn-Roberts.

Journals:
1. Journal of Systems Engineering and Electronics
2. IEEE Transactions on Very Large Scale Integration (VLSI) Systems
3. IEEE Transactions on Communication and Electronics

Softwares:
1. LaTeX for document preparation
2. Reference management tools (EndNote, Mendeley, Zotero)
3. Data visualization tools (Google Charts, Tableau, Excel)

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M. Tech Second Year Electronics and Telecommunications (2024 Course)

Project Stage II

Course Code:	VLELC 1202	Credit		14
Contact Hours:	28 Hrs./week (P)	Type of Course:	Practical	
Examination Scheme	Term-work 150 marks	Oral/Presentation 50 marks		

Course assessment methods/tools:

Sr. No.	Course assessment methods/tools	External/ Internal	Marks
1.	Termwork Evaluation	Internal	150
2.	Oral/Presentation Examination	External	50

Course Objectives

1	Provide an opportunity to learn new software, interdisciplinary theory, concept, technology, etc. not covered in earlier subjects.
2	Empower students to use engineering knowledge and skills learned in previous courses to deliver a product that has passed through the design, analysis, testing, and evaluation.
3	Encourage multidisciplinary project work through the integration of knowledge.
4	Allow students to develop problem-solving, analysis, synthesis, and evaluation skills.
5	Improve students' communication skills by asking them to produce both a professional report and to give an oral presentation.
6	Exposed to the project management skills and ethical practices in project.

Course Outcomes: Students will be able to

1202.1	Identify tools, techniques, methods, concepts, measuring devices, and instruments required for the project to define the methodology of the project.
1202.2	Justify the selection of electrical, electronic and mechanical components for the project prototyping.
1202.3	Select the appropriate testing method for system performance evaluation.
1202.4	Interpret results obtained by simulation, and hardware implementation and decide on further action or write a conclusion.
1202.5	Write a project report and research paper on the project work.

Topics covered:

In Project Stage–II, the student shall complete the remaining part of the project which will consist of simulation, fabrication of set up required for the project, workstation, conducting experiments and taking results, analysis & validation of results and conclusions.

A student must publish minimum one paper based on the dissertation work in the reputed national or international journal (SCOPUS). Details of this publication should be mentioned in the final report. The dissertation work of candidate would be evaluated by the guide as well as panel of internal/external experts, before submitting it to the university so as to ensure basic minimum quality standard. A proper record of this evaluation is needed to be maintained.

A guide should maintain record of discussion related to the topic, work carried out by the student, action taken etc. The student shall prepare the duly certified final report of project work in standard format for satisfactory completion of the work by the concerned guide, head of the Program and head of the Institute.

M. Tech Second Year Electronics and Telecommunications (2024 Course)

Introduction to Cyber Security

Course Code:	VLHSM 1203	Credit		4
Contact Hours:	3 Hrs./week (T) 2 Hrs./week (P)	Type of Course:		Lecture/ Practical
Examination Scheme	Term-work 50 marks			

Course assessment methods/tools:

Sr. No.	Course assessment methods/tools	External/ Internal	Marks
1.	Term work Evaluation	Internal	50

Course Objectives

1	To explain the basic terminologies related to cyber security and current cyber security threat landscape.
2	To explain the cyber-attacks and train students to how report these crimes through the prescribed legal and Government channels.
3	To explain the legal framework that exist in India for cyber crimes and penalties and punishments for such crimes.
4	To explain the aspects related to personal data privacy and security.
5	To explain the main components of cyber security plan.

Course Outcomes: Students will be able to

1203.1	Understand the basic terminologies related to cyber security and current cyber security threat landscape.
1203.2	Understand the cyber-attacks that target computers, mobiles and persons. They will also develop understanding about the type and nature of cyber crimes and as to how report these crimes through the prescribed legal and Government channels.
1203.3	Understand the legal framework that exists in India for cyber crimes and penalties and punishments for such crimes. It will also expose students to limitations of existing IT Act,2000 legal framework that is followed in other countries and legal and ethical aspects related to new technologies.
1203.4	Understand the aspects related to personal data privacy and security. They will also get insight into the Data Protection Bill,2019 and data privacy and security issues related to Social media platforms.
1203.5	Understand the main components of cyber security plan. They will also get insights into risk-based assessment, requirement of security controls and need for cyber security audit and compliance.

Topics covered:

Module I: Overview of Cyber Security (10 hrs.)
Cyber security increasing threat landscape, Cyber security terminologies- Cyberspace, attack, attack vector, attack surface, threat, risk, vulnerability, exploit, exploitation, hacker., Non-state actors, Cyber terrorism, Protection of end user machine, Critical IT and National Critical Infrastructure, Cyberwarfare, Case Studies.

Practical 1: Platforms for reporting cyber crimes.

Module II: Cyber Crimes (10 hrs.)
Cyber crimes targeting Computer systems and Mobiles- data diddling attacks, spyware, logic bombs, DoS, DDoS, APTs, virus, Trojans, ransomware, data breach., Online scams and frauds- email scams, Phishing, Vishing, Smishing, Online job fraud, Online sextortion, Debit/ credit card fraud, Online payment fraud, Cyberbullying, website defacement, Cyber-squatting, Pharming, Cyber espionage,

Cryptojacking, Darknet- illegal trades, drug trafficking, human trafficking., Social Media Scams & Frauds- impersonation, identity theft, job scams, misinformation, fake newscyber crime against persons -cyber grooming, child pornography, cyber stalking., Social Engineering attacks, Cyber Police stations, Crime reporting procedure, Case studies.

Practical 2: Checklist for reporting cyber crimes online.

Module III: Cyber Law (10 hrs.)

Cyber crime and legal landscape around the world, IT Act,2000 and its amendments. Limitations of IT Act, 2000. Cyber crime and punishments, Cyber Laws and Legal and ethical aspects related to new technologies- AI/ML, IoT, Blockchain, Darknet and Social media, Cyber Laws of other countries, Case Studies.

Module IV: Data Privacy and Data Security (10 hrs.)

Defining data, meta-data, big data, non-personal data. Data protection, Data privacy and data security, Personal Data Protection Bill and its compliance, Data protection principles, Big data security issues and challenges, Data protection regulations of other countries- General Data Protection Regulations(GDPR),2016 Personal Information Protection and Electronic Documents Act (PIPEDA)., Social media- data privacy and security issues.

Practical 3: Setting privacy settings on social media platforms.

Practical 4: Do's and Don'ts for posting content on Social media platforms.

Practical 5: Registering complaints on a Social media platform.

Module IV: Cyber security Management, Compliance and Governance (10 hrs.)

Cyber security Plan- cyber security policy, cyber crises management plan., Business continuity, Risk assessment, Types of security controls and their goals, Cyber security audit and compliance, National cyber security policy and strategy.

Practical 6: Prepare password policy for computer and mobile device.

Practical 7: List out security controls for computer and implement technical security controls in the personal computer.

Practical 8: List out security controls for mobile phone and implement technical security controls in the personal mobile phone.

Practical 9: Log into computer system as an administrator and check the security policies in the system.

Text Books:

1. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd.
2. Information Warfare and Security by Dorothy F. Denning, Addison Wesley.
3. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform.
4. Data Privacy Principles and Practice by Natraj Venkataramanan and Ashwin Shriram, CRC Press.
5. Information Security Governance, Guidance for Information Security Managers by W. KragBrothy, 1st Edition, Wiley Publication.
6. Auditing IT Infrastructures for Compliance By Martin Weiss, Michael G. Solomon, 2nd Edition, Jones Bartlett Learning.

E- Books / E- Learning References: https://onlinecourses.nptel.ac.in/noc24_cs121/preview

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