

COURSE STRUCTURE

(Effective from Academic Year 2026-27)

M. Sc. Electronics

(based on NEP 2020)



Department of Applied Sciences and Humanities
Faculty of Engineering & Technology
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Brief About the Program

The Department of Applied Sciences and Humanities introduced the Master of Science (M.Sc.) in Electronics programme in 1994 to meet the growing demand for skilled and qualified professionals in the field of Electronics. The programme is a two-year postgraduate course consisting of four semesters. Each semester includes 12–16 weeks of classroom teaching followed by end-semester examinations. Students' performance is evaluated through continuous assessment methods, including class tests, mid-term examinations, assignments, practical work, and end-semester examinations. This approach ensures quality education with strong theoretical knowledge and practical skills.

The M.Sc. Electronics programme is designed to provide students with strong fundamental knowledge of core electronics along with exposure to modern and applied areas. The programme focuses on the design, analysis, and application of electronic systems. Major areas covered include Electronic Devices and Digital Logic, Modern Communication Systems, RF and Microwave Engineering, Antennas, Data Communication and Networking, Advanced Digital Signal Processing, Optoelectronics, Control Systems, and VLSI Design.

The students are also provided knowledge of Device Fabrication Technology and Advanced Research Material Characterization Techniques, which help them understand modern electronic device development and research processes.

The programme also introduces students to emerging and interdisciplinary areas such as Computational Intelligence, Research Methodology in Electronics, Carbon Materials and Manufacturing, Sensors and Actuators, Photonic Integrated Circuits, Laser Technology and Laser Systems, FPGA-based Signal Processing Systems, Spread Spectrum Communication and Jamming Techniques, Advanced Materials and Processing, Nanomaterials and their Applications, Nanophotonics, Plasmonics, Metamaterials, Photonic Crystals, Microelectronics, and Mathematical Foundations of Machine Learning through SWAYAM courses.

The main objective of this programme is to develop skilled professionals with strong theoretical understanding and practical expertise in Electronics. The programme prepares students to design, develop, test, and implement electronic systems according to industrial requirements. It also encourages students to participate in research activities, innovation, and entrepreneurship.

After completing the M.Sc. Electronics programme, students can pursue higher studies such as M.Tech., Ph.D. in Electronics and related fields. Graduates have career opportunities in various sectors such as telecommunications, defence, research organizations, electronics industries, software and IT industries, hardware manufacturing, and government organizations including Defence Research and Development Organisation (DRDO), Indian Space Research Organisation (ISRO), Bharat Electronics Limited (BEL), and other research and technology-based organizations.

Programme Educational Objectives (PEOs)

The Department of Applied Sciences and Humanities, in consultation with stakeholders, has formulated Programme Educational Objectives (PEOs). These PEOs are broad statements that describe the expected career growth, professional achievements, and skills that graduates of the M.Sc. Electronics programme are expected to attain after completing the degree. The PEOs reflect

the knowledge, technical competence, professional skills, research ability, and ethical values required for successful careers in academics, industries, research organizations, and society.

The PEOs of the M.Sc. Electronics programme are as follows:

PEO1: Advanced Knowledge and Technical Competence

To provide students with strong theoretical and practical knowledge in core and advanced areas of Electronics, including electronic devices, digital systems, communication technologies, signal processing, VLSI, optoelectronics, and emerging technologies. The programme aims to develop skilled professionals capable of analyzing, designing, and implementing electronic systems for academic, industrial, and research applications.

PEO2: Research, Innovation, and Problem-Solving Ability

To develop analytical thinking, creativity, and research skills among students by encouraging them to apply scientific principles, modern tools, and research methodologies for solving real-world problems. The programme motivates students to undertake innovative projects, explore new technologies, and contribute to research and development activities.

PEO3: Professional Development and Career Advancement

To prepare graduates with technical expertise, practical skills, communication abilities, and professional competence required for careers in industries, research organizations, and technology-based sectors. The programme also encourages students to pursue higher education, research careers, entrepreneurship, and lifelong learning to adapt to changing technological environments.

PEO4: Ethical Values and Social Responsibility

To develop responsible professionals with strong ethical values, leadership qualities, and awareness of social and environmental responsibilities. The programme aims to encourage students to use their knowledge and skills for sustainable technological development and the benefit of society.

Programme Specific Outcomes (PSOs)

After successful completion of the M.Sc. Electronics programme, students will be able to:

PSO1: Design, analyze, and implement electronic systems and applications in core and advanced areas of Electronics.

PSO2: Apply theoretical knowledge, practical skills, and modern hardware and software tools to solve real-time problems related to Electronics and allied fields.

PSO3: Use research methodologies, advanced technologies, and innovative approaches to develop solutions for industrial, scientific, and societal challenges.

PSO4: Demonstrate skills in emerging areas of Electronics such as communication systems, VLSI, embedded systems, photonics, nanotechnology, and signal processing.

COURSE STRUCTURE**M. Sc. Electronics Programme under NEP 2020****FIRST SEMESTER**

	Paper Code	Paper Title	Credit	Period Per Week		Distribution of marks		
				L	P	Mid Semester Test	End Semester Exam	Total
						Max Marks	Max Marks	
Semester I (Course Level 400)	MSE-101	Electronic Devices and Digital Logic	4	4	-	40	60	100
	MSE-102	Modern Communication Systems	4	4	-	40	60	100
	MSE-103	Computational Intelligence and Research Methods in Electronics	4	4	-	40	60	100
	MSE-104	Fundamentals of Device Fabrication Technology	4	4		40	60	100
	MSE-105	Data Communication and Networking	4	4		40	60	100
	MSE-151	Electronics Lab	2	-	4	30	20	50
	MSE-152	Computational Lab	2	-	4	30	20	50
		TOTAL CREDITS	24			TOTAL MARKS		600

SECOND SEMESTER

	Paper Code	Paper Title	Credit	Period Per Week		Distribution of marks		
				L	P	Mid Semester Test	End Semester Exam	Total
						Max Marks	Max Marks	
Semester II (Course Level 500)	MSE-201	Optoelectronics	4	4	-	40	60	100
	MSE-202	Control Systems	4	4	-	40	60	100
	MSE-203	VLSI Design	4	4	-	40	60	100
	MSE-251	Optoelectronics Lab	2	-	4	30	20	50
	MSE-271	Seminar	2	-	4	30	20	50
	SWAYAM Course (any Two)							
	MSE-204	Carbon Materials and Manufacturing	4	4	-	40	60	100
	MSE-205	Sensors and Actuators	4	4	-	40	60	100
	MSE-206	Photonic Integrated Circuit	4	4	-	40	60	100
	MSE-207	An Introduction to Lasers and Laser Systems	4	4	-	40	60	100
	MSE-208	FPGA Based Signal Processing Systems	4	4	-	40	60	100
	MSE-209	Spread Spectrum Communications and Jamming	4	4	-	40	60	100
		TOTAL CREDITS	24			TOTAL MARKS		600

THIRD SEMESTER

	Paper Code	Paper Title	Credit	Period Per Week		Distribution of marks		
				L	P	Mid Semester Test	End Semester Exam	Total
						Max Marks	Max Marks	
Semester III (for 2-year PG) Semester I (for 1-year PG) (Course Level 500)	MSE-301	RF Microwave and Antennas	4	4	-	40	60	100
	MSE-302	Advanced Digital Signal Processing	4	4	-	40	60	100
	MSE-303	Advanced Research Characterization Methods	4	4		40	60	100
	MSE-351	Minor Project	4	-	4	60	40	100
	SWAYAM Course (any Two)							
	MSE-304	Advanced Materials and Processes	4	4	-	40	60	100
	MSE-305	Nanomaterials and their Properties	4	4	-	40	60	100
	MSE-306	Nanophotonics, Plasmonics, and Metamaterials	4	4	-	40	60	100
	MSE-307	Photonic Crystals: Fundamentals & Applications	4	4	-	40	60	100
	MSE-308	Microelectronics: Devices to Circuits	4	4	-	40	60	100
	MSE-309	Mathematical Foundations for Machine Learning	4	4	-	40	60	100
		TOTAL CREDITS	24			TOTAL MARKS		600

FOURTH SEMESTER

Semester IV (for 2-year PG) Semester II (for 1-year PG) (Course Level 500)	Paper Code	Paper Title	Credit	Period Per Week		Distribution of marks		
				L	P	Mid Semester Test	End Semester Exam	Total
						Max Marks	Max Marks	
	MSE-401	PG Thesis Submission	16	-	14	240	160	400
	MSE-402	PG Thesis Viva-Voce	04	-	04	60	40	100
		TOTAL CREDITS	20			TOTAL MARKS		500