

ELECTRONIC SCIENCE DEPARTMENT
KURUKSHETRA UNIVERSITY KURUKSHETRA

Department Profile

The Electronic Science Department was established in 1990 with the aim of generating specially trained manpower in the highly sophisticated field of microelectronics, integrated circuit design, fabrication and semiconductor material technology. This department was established with funding from Department of Electronics, Ministry of Communication and Information Technology, Govt. of India, UGC and Haryana state government. There are laboratories for providing practical training to students in the areas of device fabrication, thin film technology, photolithography, computer aided simulation, design, test & measurement with modern equipment and facilities. Research in areas related to Electronics is also undertaken.

Chairperson : Prof. P.J.George

Contact Information : Ph. No. 01744-238023(O), EPABX 238410- 2123(Extn.)(O).
2723®

Faculty Information :

Name	Qualification	Specialization	Contact information	Date of Joining
Professor				
Dr. P.J George	M.Sc., M.Tech., Ph.D	Semiconductor Electronics	Pj.pjgeorge@gmail.com	3.10.1978
Dr. Anil Vohra	M.Sc., Ph.D	Semiconductor Electronic Devices, Nanoelectronic Materials & Devices, Microwave (Materials & Devices)	Vohra64@gmail.com	4.11.91
Dr. Dinesh Kumar	M.Sc., M.Phil., Ph.D	Microelectronics processing and electronic Materials	dineshelectronics@gmail.com	19.1.87
Reader				
Dr. B.Prasad	M.Sc., M.Phil., Ph.D.	Device modeling, Monte-Carlo simulation of carrier transport	Bprasad2005@gmail.com	30.7.90
Sr. Lecturer				
Ms.Anurekha	M.Sc.,	Microprocessors.	01744-	5.12.90

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Sharma	M.Tech.	Digital Electronic MEMS	238545	
Lecturer				
Mr. Suresh Kumar	M.Sc.	Microelectronics & Nanotechnology	9896078123 sawan2k2@ yahoo.co.in	12.11.97
Dr. Mukesh Kumar	M.Sc., Ph.D.	Microelectronics, MEMS, Nanotechnology	kumarmukesh@gmail.com	13.3.06
Mr. Virender Singh	M.Sc.	Non. Cryst. Substances	9812229036	13.3.06

Courses Offered

Type of course (Postgraduate & others)

System of Examination

M.Sc. Electronic Science
M.Sc. Information Technology
M.Tech Microelectronics & VLSI Design

Semester system
Semester System
Semester System

Profile of different courses offered

Degree Type	Course Duration	No. of sanctioned seats	Scheme of Exam. (Annual/Semester)
M.Sc. Electronic Sc.	2 years	34	Semester
M.Sc. Inf. Tech.	2 years	40	Semester
M.Tech. Microelectronics & VLSI Design	2 years	20	Semester

Details of different Courses

Course Name : M.Sc. Electronic Sc
Course Type : Postgraduate
Exam.Scheme : Semester
Duration : Two Years

Scheme of Examination - M.Sc Electronic Science

(Four Semester course)

w.e.f. 2005 - 06

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Code No.	Paper Name				
		Paper Type	Max.Marks	Int. Marks	Ext. Marks
Semester I					
EL 1.1	Mathematical & Computational Techniques	Compulsory	100	40	60
EL 1.2	Device Electronics for ICs	Compulsory	100	40	60
EL 1.3	Device Models and Circuit Simulation	Compulsory	100	40	60
EL 1.4	Digital Circuits and Systems Design	Compulsory	100	40	60
EL 1.5	Electronic Instrumentation & Control	Compulsory	100	40	60
EL 1.6	Laboratory I	Compulsory	100	40	60
EL 1.7	Laboratory II	Compulsory	100	40	60
Semester II					
EL 2.1	Integrated Circuit Processing Techniques	Compulsory	100	40	60
EL 2.2	EM Theory, Communication Techniques & Systems	Compulsory	100	40	60
EL 2.3	Microprocessor -Architecture & Programming	Compulsory	100	40	60
EL 2.4	Optoelectronic Devices and Optical Communication	Compulsory	100	40	60
EL 2.5	Microwave Techniques & Devices	Compulsory	100	40	60
EL 2.6	Laboratory III	Compulsory	100	40	60
EL 2.7	Laboratory IV	Compulsory	100	40	60
Semester III					
EL 3.1	Solid State Circuits	Compulsory	100	40	60
EL 3.2	Semiconductor Material and Device Characterisation	Compulsory	100	40	60
EL 3.3	I. CAD Tools for IC Design	Optional	100	40	60
	II. Advanced VLSI Processing Techniques	Optional	100	40	60
	III. Modeling Techniques for Submicron Devices	Optional	100	40	60
EL 3.4	Project Report and Viva Voce	Compulsory	300	0	300
Semester IV					
EL 4.1	MOS VLSI Design Technology	Compulsory	100	40	60
EL 4.2	Materials for VLSI	Compulsory	100	40	60
EL 4.3	I. Custom Microelectronics & ASICs	Optional	100	40	60
	II. Digital Signal Processing in VLSI	Optional	100	40	60
	III. Optical Fiber Communication	Optional	100	40	60
	IV. Digital Communication	Optional	100	40	60
EL 4.4	Current Topic Seminar in	Compulsory	100	0	100

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EL 4.5	Electronics Laboratory V	Compulsory	100	40	60
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M.Sc. Information Technology

Course Name	:	M.Sc. Information Technology
Course Type	:	Postgraduate
Exam.Scheme	:	Semester
Duration	:	Two Years

Scheme of Examination

Code No.	Paper Name	Paper Type	Max. Marks	Int. Marks	Ext. Marks
I Semester:		Compulsory			
IT 1.1	Numerical Methods For Computation	Compulsory	100	20	80
IT 1.2	Computer Electronics	Compulsory	100	20	80
IT 1.3	Programming in C And C++	Compulsory	100	20	80
IT 1.4	Microprocessor-Architecture, Programming and Interfacing	Compulsory	100	20	80
IT 1.5	Lab Work I	Compulsory	100	20	
IT 1.6	Lab Work II	Compulsory	100	20	
II Semester:					
IT 2.1	Communication Technology	Compulsory	100	20	80
IT 2.2	Data Structures and Design Algorithms	Compulsory	100	20	80
IT 2.3	Computer System Architecture	Compulsory	100	20	80
IT 2.4	Computer Networks	Compulsory	100	20	80

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IT 2.5 Lab work III	Compulsory	100	20	
IT 2.6 Lab work IV	Compulsory	100	20	
Semester III				
IT 3.1 Software Engineering	Compulsory	100	20	80
IT 3.2 Database Management Systems	Compulsory	100	20	80
IT 3.3 Java and JavaScript Programming	Compulsory	100	20	80
IT 3.4 Web Page Design Techniques	Compulsory	100	20	80
IT 3.5 Lab work V	Compulsory	100	20	
IT 3.6 Lab work VI	Compulsory	100	20	
IT 3.7 Project work (3 months duration) *	Compulsory			
Semester IV				
IT 4.1 IT Management	Compulsory	100	20	80
IT 4.2 Internet and e-Commerce	Compulsory	100	20	80
IT 4.3 Web Design Tools and Multimedia	Compulsory	100	20	80
IT 4.4 Telecommunications and Network Management	Compulsory	100	20	80
IT 4.5 Lab work VII	Compulsory	100	20	
IT 4.6 Lab work VIII	Compulsory	100	20	

M.Tech. (Microelectronics and VLSI Design)

Course Name	:	M.Tech. Microelectronics & VLSI Design
Course Type	:	Postgraduate
Exam.Scheme	:	Semester
Duration	:	Two Years

Course Structure and Scheme of Evaluation

Code No.	Paper Name	Paper Type	Max. Marks	Int. Marks	Ext. Marks
I Semester					
MMVD 1.1	Process Technology for ULSI-I	Compulsory	100	40	60
MMVD 1.2	Modeling Techniques for Sub Micron Devices	Compulsory	100	40	60

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MMVD 1.3	VLSI Design- System on Silicon	Compulsory	100	40	60
MMVD 1.4	Hardware Description Languages	Compulsory	100	40	60
MMVD 1.5	Lab work-I	Compulsory	100	40	
Semester II					
MMVD 2.1	Process Technology for ULSI- II	Compulsory	100	40	60
MMVD 2.2	Embedded Systems	Compulsory	100	40	60
MMVD 2.3	Analog CMOS Integrated Circuits	Compulsory	100	40	60
MMVD 2.4	Digital Signal Processing	Compulsory	100	40	60
MMVD 2.5	Lab work-II	Compulsory	100	40	

M.Tech. (Microelectronics and VLSI Design)

Course Structure and Scheme of Evaluation

Code No.	Paper Name	Paper Type	Max. Marks	Int. Marks	Ext. Marks
Semester III					
MMVD 3.1	Process Technology for ULSI- III	Compulsory	100	40	60
MMVD	Digital Signal Processing in	Compulsory	100	40	60

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3.2	VLSI				
Option (i)					
MMVD	RF Microelectronics	Compulsory	100	40	60
3.2					
Option (ii)					
MMVD	MEMS and Nano Technology	Compulsory	100	40	60
3.2					
Option (iii)					
MMVD	Digital System Testing and Fault Simulation	Compulsory	100	40	60
3.2					
Option (iv)					
MMVD	Current Topic Seminar	Compulsory	50	50	
3.3					
MMVD	Lab work-III	Compulsory	100	40	
3.4					
Semester IV					
MMVD	Project* - Report and Viva	Compulsory			
4.1	Voce				

Facilities:

Library :

Department also provides students with an inbuilt library facility which has about 1000 books on latest topics, magazines and journals and other reference material.

Lab Facilities

There are facilities for classroom experiments for which there exist labs like

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Basic Circuit and Devices Lab:

This lab has many test and measurement instruments, Digital and analog Oscilloscopes, Curve Tracer, Hall Effect measurement setup, Four-Probe setup and a number of kits for digital and analog circuits.

Microprocessors and Computer Lab: This Lab has 8085/8086 microprocessor-training kits, their interfacing modules, PCs, Circuit simulation tools, device simulation tools, VLSI design tools and other relevant software.

Metallization Lab:

This lab has a thin film-coating unit and PECVD system

Photolithography Lab:

This lab has a deionised water plant, Mask aligner, Laminar flow chemical bench, photresist coater and other facilities for photolithography and pattern making for IC fabrication.

Diffusion & Oxidation Lab :

This lab has diffusion, oxidation and annealing furnaces. Students fabricate metal semiconductor devices using these facilities.

Test & Measurement Lab:

This lab has Keithley simultaneous C-V analyzer, Keithley Programmable Electrometer, Le-Croy Digital Storage Oscilloscope, Digital and Analog high frequency Oscilloscopes, Logic Analyzer, and other test and measurement equipment

Other Facilities

The department provides consultancy services to the electronics industries in the neighbourhood. The faculty members and supporting technical staff have undertaken some industry sponsored consultancy projects to help design, develop and improve the performance of certain products. The department has potential to undertake industrial projects in various areas of design and development of digital systems, microprocessors based process control systems, software development, FPGA based ASIC design, thin film coating and vacuum systems etc. The department has a well equipped Test and Measurement Lab and computer facilities to undertake testing and characterization of electronic instruments and devices.

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Placement Cell

The department has an internal placement cell under the guidance of a senior teacher. This cell prepares the placement brochures and arranges campus interviews for placement and training. It also arranges talks by experts from industry and facilitates interaction between students and industries. This cell has been successful in placing the students in many reputed industries and institutes.

Information on Seminar and Conferences:

1. IMS Conference, 2006 Feb. 16th to 18th
2. NASET 07 planned on March 23rd – 24th

Information on Research Activities (Projects)

Name of the teacher	Title of the project	Duration	Funding Agency	Amount (in Lakhs)
Dr. B.Prasad	Study of Oxynitride Films	1994-96	UGC	0.5
Dr. P.J.George, Dr. Anil Vohra, Dr. Dinesh Kumar	Fabrication of PECVD system for thin film transistor	1994-1996	AICTE	5.0
Ms. Anurekha Sharma	Study and Fabrication of various types of M-S Contacts,	1995-97	UGC	0.5
Dr. Anil Vohra	Design of Digital internal Communication System	1995-97	UGC	0.5 lacs
Dr. Dinesh Kumar	Studies of pinning parameters in NbTa superconducting thin films	1995-97	UGC	0.25
Dr. Dinesh Kumar	Fabrication of InAs based MOS devices	1999-2001	UGC	0.5
Prof. P.J. George, Dr. Anil Vohra and Dr. Dinesh Kumar	Surface Modification by Plasma Source Ion Implantation (i) To Reduce High Temperature Corrosion in Metals and (ii) To improve Adhesion of	2000-04	DST	17.5

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	metal Films on Semiconductors			
Dr. P.J.Geprge, Dr. Dinesh Kumar & Dr. B.Prasad	Plasma source ion – implantation of nitrogen in silicon MOS devices	2001-04	UGC	5.92
Dr. Dinesh Kumar, Dr. B.Prasad	Study of thin diffusion barrier materials for Low resistance Copper metallization for ULSI applications	2006-09	UGC	7.67

Information on Achievement

The department has entered in MoU with CEERI, Pilani and CSIO, Chandigarh to enlarge the scope of R& D activities. Under this scheme many faculty members and students are actively participating in R& D work. A number of scientists working in these institutes are pursuing their doctorate work under this university.