Semester Course Structure for APPLIED ELECTRONICS AND BIO-MEDICAL INSTRUMENTATION (AEBMI)

Department of Physics

Department at a glance :

1. Well-equipped Advanced Physics, Bio-Medical and Electronics Laboratory
2. Research oriented updated course and learned faculties with vast experience
3. Special Emphasis on experiments/hands on training and industry oriented projects
4. Dissertation in collaboration with Research institutes / Universities / Industries
5. Six - Eight weeks internship program in Industry / Institutes/Health sector.

The M.Sc. (Tech.) in Applied Electronics and Biomedical Instrumentation aims to produce postgraduates with an ability to develop medical instruments and systems used for monitoring, detecting and analyzing biomedical data. The present program will provide opportunity to develop practical skill sets. The student will also develop an in-depth understanding of the Physics and technology behind the medical devices use in health sectors eg: diagnostic devices, therapeutic devices, medical imaging equipment and medical instrumentation devices.

The course/syllabus includes discussion of medical equipment and its design by investigating a range of issues including user regulation, requirements, impacts of risk, legislation, quality insurance mechanisms, certification and ethics. A graduate from this course will be able to immediately participate in this multi-disciplined engineering sector of biomedical and medical instrumentation device and systems design. Industry interaction and hands-on-training program in collaboration with Heath sector/Hospitals are conducted as a component of course-curriculum.

Career Placement

1. An updated and modernized syllabus with emphasis on proper laboratory& Industry training along with compulsory seminar / colloquium presentation and major project work will enable students to be equipped for employment as faculty member or research scientist in any University and Research Institutes in India and abroad.
2. The present course will help to build a career in organizations dealing with Medical Electronics, Electronics& Instrument industry, Nano Bio-Technology, Robotics & Artificial Intelligence and related research domain.
3. Programs designed with specific applications will enable students to start their own entrepreneurship.
4. Medical Electronic Device Engineer in Health sector / Hospital
5. Biomaterial Engineer in Medical sector
6. Clinical Engineer in Bio-Industry
7. Medical Officer in Health care Unit
8. The courses on career and skill development (i.e., the Foundation courses) offered in the curriculum will enable students to compete in national level competitive examinations like NET / SET / GATE / CSIR/ JEST / DST / DRDO / ISRO / UPSC etc.

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Semester Curriculum for Postgraduate (M.Sc. Tech) Program in Applied Electronics and Biomedical Instrumentation

Distribution of Papers Semester-wise:

Semester - I				
Paper Name	**Paper Code**	**No of Papers**	**Credit**	**L-T-P**
Applied Mathematics& Statistics		1	4	4-0-0
Hospital Management System		1	4	
Anatomy and Physiology		1	4	4-0-0
Advanced Electronic Circuits & Microprocessor		1	4	4-0-0
Bio-Materials and Tissue Engineering		1	4	4-0-0
Advanced Electronics Circuit Lab		1	2	0-0-3
Micro-processor Lab		1	2	0-0-3
Total		**5 + 2 = 7**	**24**	

Semester II				
Paper Name	**Paper Code**	**No of Papers**	**Credit**	**L-T-P**
Sensors –Transducers and MEMS Technology		1	4	4-0-0
Digital Signal Processing		1	4	4-0-0
Clinical Instruments& Systems		1	4	4-0-0
Medical Application of Spectroscopy and Image Processing		1	4	4-0-0
Applied Nano- Photonics & Quantum Electronics		1	4	4-0-0
Simulation in Biomedical Engineering		1	2	0-0-3
Sensor and Medical Instruments Lab		1	2	0-0-3
Spectroscopy and Image Processing Lab		1	2	0-0-3
Total		5 + 3 = **8**	**26**	

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Semester III				
Paper Name	**Paper Code**	**No of Papers**	**Credit**	**L-T-P**
Advanced Medical Equipment: Operation, Calibration, Maintenance and Safety		1	4	4-0-0
Elective I		1	4	4-0-0
Elective II		1	4	4-0-0
Rehabilitation Technology and Artificial Organ		1	4	4-0-0
Industry Interaction		1	2	
Seminar on Contemporary Research		1	2	
Elective I Lab		1	2	0-0-3
Total		4 + 2 + 1 = **7**	**22**	

Semester IV				
Paper Name	**Paper Code**	**No of Papers**	**Credit**	**L-T-P**
Elective III		1	4	4-0-0
Defense of Dissertation & Comprehensive Viva-Voce		1	4	
Dissertation		1	20	
Total		1+1+1	**28**	

TOTAL CREDIT: 100

Options for Elective Papers	
Sl. No	**Name of the Paper**
1.	Robotics and Artificial Intelligence
2.	Nuclear Medicine Technology
3.	VLSI and Embedded systems
4.	Bio-Informatics and Simulation of Physiological Systems
5.	Radiation Safety Techniques
6.	Advanced Bio-Materials and Prosthetics
7.	Bio-Telemetry and Tele-Medicine
8.	Brain-Computer Interface
9.	Tissue Engineering
10.	Bio-MEMS
11.	Medical Optics
12.	Nano-medicine and Drug Delivery
13.	Physics of Medicines