



Indian Institute of Information Technology - Allahabad

Deoghat, Jhalwa- 211015, Prayagraj, Uttar Pradesh

Department of Applied Sciences

M.Tech Curriculum 2023-24

Department of Applied Science

(NEP based Curriculum)

Guidelines for M. Tech& Dual degree M. Tech-PhD 2023-24

PC- Programme Core, PE- Programme Elective, ES- Engineering Science, BS- Basic Science, OE- Open Elective, HM- Humanities and Management, MR- Minor, HR- Honor, AC- Audit Course

L-T-P (hr)

Lecture (L): 1 Credit = 1 hr/ week, Tutorial (T): 1 Credit = 1hr/week, Practical (P): 1 credit = 2 hr/week

The credits for all courses are given in LTP format. L stands for Lecture, T for Tutorial, P for Practice/Practical. L=3 signifies 3 hours of Lectures per week, T=1 signifies 1 hour of Tutorial per week, and P=1 corresponds to 2 hours Practice/Practical per week. For M. Tech. students, T and P need not be explicitly mentioned in the Time Table. The Practice/Practical component of the course could also be a Term paper or Term Paper along with the lab. The discretion is left to the Teacher teaching the course.

The dual degree M.Tech.-Ph.D. Programme has been kept reserved. This is in tune with the spirit of NEP 2020. It is envisaged with a target towards research leading to a PhD programme with a minimum duration of 04 years, and with a possible exit for the award of MTech degree and/or PG Diploma after securing required credits.

Please refer to the M.Tech. and Ph.D. Ordinance for the other details of the M. Tech. and Ph.D. programs that is available at the following link: <https://aaa.iita.ac.in/>

The AS Department is offering the following specializations in each group:



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M. Tech Biomedical Engineering

The M. Tech Biomedical Engineering program at IIIT-Allahabad is designed to provide students with a comprehensive understanding of the interdisciplinary field that combines principles of engineering, medicine, and biology. The mission of the Biomedical Engineering course at IIIT-A is to build up clinically adaptable solutions for human health by educating the next generation of biomedical engineers, cultivating leaders, and nurturing the amalgamation of science, engineering, and medicine in a discovery-focused environment. The main educational objective is to offer a systematic training in the fundamentals of engineering science, design, and biology. The curriculum is planned to endow with concepts essential to understanding living systems from the molecular and cellular levels. The curriculum further incorporates principles of straight up integration, leading to the choice of a technical area (biomedical imaging and instrumentation, cellular engineering, computational biomedical engineering, or biomechanics), and culminates in a biomedical device design experience. With state-of-the-art facilities and a team of experienced faculty members, IIIT-Allahabad is committed to offering students a stimulating and nurturing learning environment.

Total Credit Distribution

Semester	Semester I	Semester II	Summer Semester	Semester III	Semester IV	Total Credits
M. Tech	18	19	0	17	12	66
PG Diploma	18	19	5	-	-	42



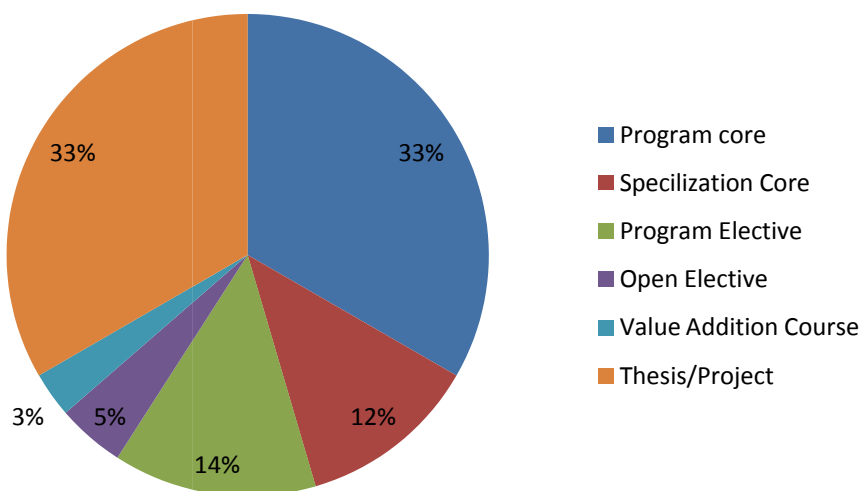
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M. Tech BME, Credit Distribution

M. Tech BI		I	II	III	IV	Total Credits	
1.	Program core	8	14			22	33%
2.	Specialization Core	8				8	12%
3.	Program Elective		3	6		9	14%
4.	Open Elective			3		3	5%
5.	Value Addition Course		2			2	3%
6.	Thesis/Project		2	8	12	22	33%





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Table 1: First Semester

Hard-Core Subjects

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Biomedical Circuits and Instrumentation	PC-AS-BCI501	PCC	4	3-0-2-0
2.	Biomechanics	PC-AS-BOM502	PCC	4	3-0-2-0
3.	Research Methodology & IPR	PC-AS-RMA503	ELC	2	2-0-0-0
Total Credit:				10	12 Hrs./week

Soft-Core Subjects (Choose a single basket)

Basket 1: Medical/B.Pharma. /Pharmacology/Biotechnology/M.Sc. in Biology or Life sciences

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Biosignal Processing	ES-AS-BOP501	PCC	4	3-0-2-0
2.	Biomath and Biostatistics	BS-AS-BMB501	PCC	4	3-0-2-0
Total Credit:				8	10 Hrs./week

Basket 2: Engineering/Technology/Instrumentation/Electronics/IT/CS/Physics/Applied Physics

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Molecular Biology	ES-AS-MBO502	PCC	4	3-0-2-0
2.	Anatomy & Physiology	ES-AS-APH503	PCC	4	3-0-2-0
Total Credit:				8	10 Hrs./week

Basket 3: Applied Chemistry/Applied Math

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Anatomy & Physiology	ES-AS-APH503	PCC	4	3-0-2-0
2.	Biosignal Processing	ES-AS-BOP501	PCC	4	3-0-2-0
Total Credit:				8	10 Hrs./week



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Table 2: Second Semester

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Advanced Medical Instrumentation	PC-AS-AMI504	PCC	4	3-0-2-0
2.	Biomedical Imaging	PC-AS-BIM505	PCC	4	3-0-2-0
3.	Medical Sensors and Actuators	PC-AS-MSA506	PCC	4	3-0-2-0
4.	Elective I	PE-AS-XXX501	PEC	3	3-0-0-0
5.	Mini Project	PC-AS-MPJ507	ELC	2	0-0-4-0
6.	HSMC	HM-AS-RMI501	VEC	2	2-0-0-0
Total Credi :				19	24 Hrs./week

EXIT: After the end of second Semester, after clearing all the papers, the M. Tech student may be eligible for PG Diploma in Biomedical Engineering. However, these students have to secure **additional 5 credits** from summer semester for awarding PG diploma, which is mandatory. For regular M. Tech students there is no need of summer semester.

Table 3: Summer Semester (for PG-Diploma)

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Summer Project	PC-AS-SPJ508	ELC	2	0-0-4-0
2.	Medical Instrumentation Course/NP EL	PC-AS-MIC509	PCC	3	3-0-0-0
Total Credit:				5	7 Hrs./week



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Table 4: Third Semester

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Elective II	PE-AS-XXX502	PEC	3	3-0-0-0
2.	Elective III	PE-AS-XXX503	PEC	3	3-0-0-0
3.	Open Electives	OE-XX-xxx501	OE	3	3-0-0-0
4.	Major Project	PC-AS-MPJ509	ELC	8	0-0-16-0
Total Credi :				17	25 Hrs./week

Table 5: Fourth Semester

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	M. Tech Thesis	PC-MTH510	ELC	12	0-0-24-0
Total Credi :				12	24 Hrs./week

Table 6: List of Electives (for elective I, II and III)

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Bioelectronics	PE-AS-BIE501	PEC	3	3-0-0-0
2.	Biomaterials and Tissue Engineering	PE-AS-BTE502	PEC	3	3-0-0-0
3.	Medical Image Processing	PE-AS-MIP503	PEC	3	3-0-0-0
4.	Nanobiotechnology and Nanoinformatics	PE-AS-NBN504	PEC	3	3-0-0-0
5.	Bio-MEMs	PE-AS-BIM505	PEC	3	3-0-0-0
6.	Artificial Organs and Implants	PE-AS-AOI506	PEC	3	3-0-0-0
7.	Engineering Processes in Biological Systems	PE-AS-EPB507	PEC	3	3-0-0-0
8.	Soft Computing Tools for Biomedical Engineering	PE-AS-SCT508	PEC	3	3-0-0-0
9.	Computational Methods for Biomedical Engineers	PE-AS-CMB509	PEC	3	3-0-0-0
1	Modeling of Biomedical Engineering Systems	PE-AS-MBE510	PEC	3	3-0-0-0
1	Telemedicine	PE-AS-TEM511	PEC	3	3-0-0-0



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1	Immunotechnology	PE-AS-IMT5012	PEC	3	3-0-0-0
1	Medical Information Systems and P CS	PE-AS-MIP513	PEC	3	3-0-0-0
1	Machine Learning for Medical Systems	PE-AS-MLM514	PEC	3	3-0-0-0
1	Computer Aided Drug Designing	PE-AS-CAD515	PEC	3	3-0-0-0
1	Clinical Biochemistry	PE-AS-CBC516	PEC	3	3-0-0-0
1	Infectious Disease Modeling	PE-AS-IDB517	PEC	3	3-0-0-0
1	Material Informatics	PE-AS-MIN518	PEC	3	3-0-0-0
1	Instrumentations	PE-AS-INS519	PEC	3	3-0-0-0
2	Biomedical Engineering for Space	PE-AS-BES520	PEC	3	3-0-0-0
2	Fluid Mechanics for Biological Systems	PE-AS-FMB521	PEC	3	3-0-0-0
2	Survival Analysis	PE-AS-SAN522	PEC	3	3-0-0-0
2	All the electives provided in M. Tech BI basket are available for M. Tech BME students also				
2	OPEN ELECTIVES				
2	Open Elective from IT		OE	3	
2	Open Elective from ECE		OE	3	