



# **ADAMAS UNIVERSITY**

## **SCHOOL OF ENGINEERING & TECHNOLOGY**

### **SoET 2.0**

### **(Engineering +)**

### **UG PROGRAM**

### **Course Structure of**

### **B. Tech in Biomedical Engineering**

**Applicable for Academic Year: 2020-21**

**ADAMAS UNIVERSITY**

Adamas Knowledge City

Barasat-Barrackpore Road

P.O. –Jagannathpur, District -24 Parganas (North)

Kolkata -700126, West Bengal, India

**ADAMAS UNIVERSITY**  
**SCHOOL OF ENGINEERING & TECHNOLOGY**  
**B.Tech. PROGRAMME**

**FIRST YEAR**

<b>SEMESTER I</b>								
<b>S. No</b>	<b>Type</b>	<b>Course Category</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Contact Hrs/wk</b>	<b>Credits</b>
1	Theory	<b>BSC</b>	Engineering Mathematics-I	3	1	0	4	4
2	Theory	<b>BSC</b>	Engineering Physics/Engineering Chemistry	3	0	0	3	3
3	Theory	<b>ESC</b>	Introduction to Programming/ Electrical and Electronics Technology	3	0	0	3	3
4	Theory	<b>HSSM</b>	HSSM –I (Language related)	3	0	0	3	3
5	Theory	<b>HSSM/BSC</b>	HSSM –II (Biomedical Ethics) / Biology	3	0	0	3	3
6	Practical	<b>BSC</b>	Engineering Physics Lab/Engineering Chemistry Lab	0	0	3	3	2
7	Practical	<b>ESC</b>	Programming Lab/ Electrical and Electronics Technology Lab	0	0	3	3	2
8	Practical	<b>ESC</b>	Engineering Drawing and CAD/Engineering Workshop	0	0	3	3	2
9	Practical	<b>MC EMC41201</b>	Communication and Collaboration Skills-I	0	0	2	2	1
<b>Total</b>				<b>15</b>	<b>1</b>	<b>11</b>	<b>27</b>	<b>23</b>

<b>SEMESTER II</b>								
<b>S. No</b>	<b>Type</b>	<b>Course Category</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Contact Hrs/wk</b>	<b>Credits</b>
1.	Theory	<b>BSC</b>	Engineering Mathematics– II	3	1	0	4	4
2.	Theory	<b>BSC</b>	Engineering Chemistry/ Engineering Physics	3	0	0	3	3
3.	Theory	<b>ESC</b>	Electrical and Electronics Technology/ Introduction to Programming	3	0	0	3	3
4.	Theory	<b>BSC/ HSSM</b>	Biology/HSSM –II (Biomedical Ethics)	3	0	0	3	3
5.	Theory	<b>ESC</b>	Engineering Mechanics	3	0	0	3	3
6.	Practical	<b>HSSM</b>	HSSM – III (Professional Communication in English)	0	0	3	3	2
7.	Practical	<b>BSC</b>	Engineering Chemistry Lab/Engineering Physics Lab	0	0	3	3	2
8.	Practical	<b>ESC</b>	Electrical and Electronics Technology Lab/ Programming Lab	0	0	3	3	2
9.	Practical	<b>ESC</b>	Engineering Workshop/Engineering Drawing and CAD	0	0	3	3	2
10.	Practical	<b>MC EMC41202</b>	Communication and Collaboration Skills-II	0	0	2	2	1
<b>Total</b>				<b>15</b>	<b>1</b>	<b>14</b>	<b>30</b>	<b>25</b>

**Total Credit (First Year): 48**

**HSSM:** Humanities, Social Sciences & Management

**BSC:** Basic Science

**ESC:** Engg. Science

**SECOND YEAR**

<b>Semester- III</b>								
<b>S. No</b>	<b>Type</b>	<b>Course Category</b>	<b>Subject Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Contact Hrs/week</b>	<b>Credits</b>
1.	Theory	BSC	Engineering Mathematics – III	3	1	0	3	4
2.	Theory	PC	Analog and Digital Electronics	3	1	0	4	4
3.	Theory	ESC	Anatomy & Physiology	3	1	0	4	4
4.	Theory	ESC	Signals and Network Analysis	3	1	0	4	4
5.	Theory	ESC Lab	MATLAB & Simulink	0	0	2	3	2
6.	Practical	ESC Lab	Signals and Network Analysis Lab	0	0	2	3	2
7.	Practical	PCLab	Electronics Lab	0	0	2	3	2
<b>Total</b>				<b>12</b>	<b>4</b>	<b>6</b>	<b>24</b>	<b>22</b>

<b>Semester-IV</b>								
<b>S. No</b>	<b>Type</b>	<b>Course Category</b>	<b>Subject Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Contact Hrs/week</b>	<b>Credits</b>
1.	Theory	BSC	Mathematical Biology	3	1	0	4	4
2.	Theory	PC	Biomechanics	3	0	0	3	3
3.	Theory	PC	Biomedical Instrumentation – I	3	0	0	3	3
4.	Theory	PC	Digital System Design	3	1	0	4	4
5.	Theory	ESC	Control Theory	3	1	0	4	4
6.	Practical	PCLab	Biomedical Instrumentation Lab – 1	0	0	2	3	2
7.	Practical	ESC lab	Control lab	0	0	2	3	2
8.	Practical	PCLab	Digital System Design	0	0	2	3	2
9.	Practical	PCLab	Biomechanics Lab	0	0	2	3	2
<b>Total</b>				<b>15</b>	<b>3</b>	<b>8</b>	<b>30</b>	<b>26</b>

**Total Credit (Second Year): 48**

### THIRD YEAR

<b>Semester-V</b>								
<b>S. No</b>	<b>Type</b>	<b>Course Category</b>	<b>Subject Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Contact Hrs/week</b>	<b>Credits</b>
1.	Theory	PC	Basic Clinical Science I	3	1	0	4	4
2.	Theory	PC	Biomedical Instrumentation - II	3	0	0	3	3
3.	Theory	PC	Digital Signal processing	3	1	0	4	4
4.	Theory	PC	Microcontroller Based Systems	3	1	0	4	4
5.	Theory	PC	Biochemistry	3	0	0	3	3
6.	Practical	PCLab	Biomedical Instrumentation Lab – II	0	0	2	3	2
7.	Practical	PCLab	Microcontroller Lab	0	0	2	3	2
8.	Practical	PCLab	Biochemistry Lab	0	0	2	3	2
<b>Total</b>				<b>15</b>	<b>3</b>	<b>6</b>	<b>27</b>	<b>24</b>

<b>Semester-VI</b>								
<b>S. No</b>	<b>Type</b>	<b>Course Category</b>	<b>Subject Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Contact Hrs/week</b>	<b>Credits</b>
1.	Theory	PC	Hospital Management	3	0	0	3	3
2.	Theory	PC	Basic Clinical Sciences II	3	1	0	4	4
3.	Theory	PC	Digital Image Processing	3	0	0	3	3
4.	Theory	PE	Prof. Elective- I	3	0	0	3	3
5.	Theory	PE	Prof. Elective- II	3	0	0	3	3
6.	Theory	OE	Open Elective- I	3	0	0	3	3
7.	Practical	PCLab	Medical Instruments and system lab	0	0	2	3	2
8.	Practical	PCLab	Signal and Image Processing Lab	0	0	2	3	2
<b>Total</b>				<b>18</b>	<b>1</b>	<b>4</b>	<b>25</b>	<b>23</b>

**Total Credit (Third Year): 47**

**FOURTH YEAR**

<b>Semester-VII</b>								
<b>S. No</b>	<b>Type</b>	<b>Course Category</b>	<b>Subject Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Contact Hrs/week</b>	<b>Credits</b>
1.	Theory	PE	Prof. Elective- III	3	0	0	3	3
2.	Theory	PE	Prof. Elective- IV	3	0	0	3	3
3.	Theory	OE	Open Elective- II	3	0	0	3	3
4.	Theory	OE	Open Elective- III	3	0	0	3	3
5.	Theory	OE	Open Elective- IV	3	0	0	3	3
6.	Practical	PE	Prof. Elective- III Lab	0	0	3	3	2
7.	Practical	PC	Summer Internship <sup>#</sup>	0	0	3	3	2
8.	Practical	PC	Minor Project	0	0	6	6	4
<b>Total</b>				<b>15</b>	<b>0</b>	<b>12</b>	<b>27</b>	<b>23</b>

**# Summer Internship for 30 days will be taken at the end of 6<sup>th</sup> semester, and will be evaluated in the 7<sup>th</sup> semester.**

<b>Semester-VIII</b>								
<b>S. No</b>	<b>Type</b>	<b>Course Category</b>	<b>Subject Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Contact Hrs/week</b>	<b>Credits</b>
1.		<b>PC</b>	Industry Work Experience / Major Project / Special Courses					06
2.		<b>PC</b>	Comprehensive Viva Voce	-----			-----	03
<b>Total</b>								<b>09</b>

**Total Credit (Fourth Year): 32**

**Total Credits (Over four years): (48+48+47+32) =175**

### Streaming of the 4 Professional Electives PE-I to PE-IV

Sl.No	Biomedical Data Science	Genomics and Systems Biology	Computational Medicine
1	Machine learning and Its Application to Biomedical data	Models of the Neuron	Magnetic Resonant in Medicine
2	Medical Imaging System	Physical Epigenetics	PharmocoKinetics
3	Information Theory	Introduction Genomics Research	Pharmoco Dynamics
4	Computational Protein Structure Prediction and Design	Computational Genomics: sequences	Computational Molecular Medicine
5	Data Mining	Computational Genomics: Data Analysis	Introduction to Computational Medicine
6	Neuro Data design	Introduction to non-Linear system	Precision core Medicine-I
7	Foundation of Computational Biology and Bioinformatics	Locomotion in Mechanical and Bio- system	Precision core Medicine-II
8	Bio-Telemedicine	Computational Steam cell Biology	
9		Probabilistic model of the Visual Cortex	
10		Tissue Engineering	

**Note:** Student can choose either all the 4 elective from one stream or (2+2), or (2+1+1).

#### Open Elective (Theory):

1. Medical Imaging
2. Introduction to Computation Protein Structure
3. Introduction to Genomics
4. Neuron Models

### Credit Distribution

<b>Sl. No.</b>	<b>Category</b>	<b>Breakup of Credits</b>	<b>AU Credit Distribution %</b>	<b>AICTE Credit Distribution %</b>
1.	<b>Humanities &amp; Social Sciences Courses</b>	<b>10</b>	<b>8</b>	<b>07</b>
2.	<b>Management + Economics + Commerce Courses</b>	<b>0</b>		
3.	<b>Basic Science Courses</b>	<b>24+8+0+0=32</b>	<b>18.5</b>	<b>16</b>
4.	<b>Engineering Science Courses</b>	<b>17+18+0+0=35</b>	<b>18.5</b>	<b>15</b>
5.	<b>Professional Core Courses</b>	<b>0+22+35+15=72</b>	<b>40</b>	<b>40</b>
6.	<b>Professional Elective Courses</b>	<b>0+0+6+8=14</b>	<b>8</b>	<b>11</b>
7.	<b>Open Elective Courses</b>	<b>12</b>	<b>7</b>	<b>11</b>
<b>Total Credits</b>		<b>175</b>	<b>100</b>	<b>100</b>