



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited "A" Grade by NAAC | 12B Status by UGC | Approved by AICTE

www.sathyabama.ac.in

06-05-2023

STUDENT'S CIRCULAR

This is to inform that Department of Biomedical Engineering is offering Professional Elective / CBCS courses listed below for the Batches 2020-2024 and 2021-2025 during the academic year 2023-2024 ODD Semester. The students should select one Professional elective and CBCS compulsorily from the choices given below

List of courses offered for Batch 2020-2024

S.No.	Course Code	Course Name	CBCS/Elective
1	SBMA4007	Forensic Science	CBCS
2	SBMA3011	Rehabilitation Engineering	Elective

List of courses offered for Batch 2021-2025

S.No.	Course Code	Course Name	CBCS/Elective
1	SCHA3010	Industrial Safety and Hazard Analysis	CBCS
2	SEEA4004	E- Health	CBCS
3	SITA3008	Internet of Things	CBCS
4	SBMA4006	Medical Optics and Laser Application	CBCS
5	SBMA3002	Biomems and Nanotechnology	Elective

Students are requested to register their names with respective year coordinators before the end date of registration (08-05-2022).

HOD/BIO MEDICAL

Dr. T. SUDHAKAR

DEPARTMENT OF BIOMEDICAL ENGINEERING
SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Jyoti Nagar, Rajiv Gandhi Salu
Chennai - 600 079

HOD/BIO MEDICAL

Copy to:

1. Dean (Staff Affairs)
2. Dean (Student Affairs)
3. Deans of Schools
4. All HODs
5. III & IV Year UG students

List of students enrolled for Elective / CBCS during the academic year 2023-2024**SBMA4007 - Forensic Science- Batch 2020-2024**

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	40240001	AADHITYA. S	SBMA4007	Forensic Science
2	40240002	ABIRAJ. B	SBMA4007	Forensic Science
3	40240003	ANGELIN WINSLET. C	SBMA4007	Forensic Science
4	40240004	ANUSKA CHAKRAVARTY	SBMA4007	Forensic Science
5	40240005	AROKIYA RAHUL. W	SBMA4007	Forensic Science
6	40240006	DANIEL. R	SBMA4007	Forensic Science
7	40240007	DANNY ROY	SBMA4007	Forensic Science
8	40240008	DHARANI. K	SBMA4007	Forensic Science
9	40240009	FAZILA. A	SBMA4007	Forensic Science
10	40240010	HARIPRIYA BHATTARU	SBMA4007	Forensic Science
11	40240011	JAI AKASH. B	SBMA4007	Forensic Science
12	40240012	JEFFREY DELAPERLE. S	SBMA4007	Forensic Science
13	40240013	JEY SURYA. S	SBMA4007	Forensic Science
14	40240014	JOHN WESLEY. I	SBMA4007	Forensic Science
15	40240015	KAMALESH. R	SBMA4007	Forensic Science
16	40240016	MANASA. V	SBMA4007	Forensic Science
17	40240017	MATHANGI. B	SBMA4007	Forensic Science
18	40240018	MEENATCHI S	SBMA4007	Forensic Science
19	40240019	MOHAMED AZARUDEEN. S	SBMA4007	Forensic Science
20	40240020	MOHAMMED THOUFEEQ. A	SBMA4007	Forensic Science
21	40240021	NAJEEBA. M	SBMA4007	Forensic Science
22	40240022	PONNI. S	SBMA4007	Forensic Science

23	40240023	PRAKKRITH. V	SBMA4007	Forensic Science
24	40240024	RAGHUL. A	SBMA4007	Forensic Science
25	40240025	RENNY VALENTINA. N	SBMA4007	Forensic Science
26	40240026	RISHON V	SBMA4007	Forensic Science
27	40240027	ROSHAN. B	SBMA4007	Forensic Science
28	40240028	RUFINA MAGDALIN SHALLOWM. S	SBMA4007	Forensic Science
29	40240029	SAM JUDIT. J.V	SBMA4007	Forensic Science
30	40240030	SARASWATHI. B	SBMA4007	Forensic Science
31	40240031	SETHURAMAN K	SBMA4007	Forensic Science
32	40240032	SHANUJA. M	SBMA4007	Forensic Science
33	40240033	SHARNISHA. M	SBMA4007	Forensic Science
34	40240034	SHRUTHI. L	SBMA4007	Forensic Science
35	40240035	SINDHU. ELA	SBMA4007	Forensic Science
36	40240036	SRINIVASAN. R	SBMA4007	Forensic Science
37	40240037	SRISTI. S.V	SBMA4007	Forensic Science
38	40240038	SRIVARI MUKUNTH. S	SBMA4007	Forensic Science
39	40240039	SUDHISHNA. T	SBMA4007	Forensic Science
40	40240040	SUGANTH. S	SBMA4007	Forensic Science
41	40240041	SUSHMITHA. S	SBMA4007	Forensic Science
42	40240042	TEJASWINI. S	SBMA4007	Forensic Science
43	40240043	VIJAYALAKSHMI. B	SBMA4007	Forensic Science
44	40240044	YOGAPRIYA. K	SBMA4007	Forensic Science
45	40240045	ISHA INGROLE. R	SBMA4007	Forensic Science
46	40240046	RANCY IRENE JOSE. J	SBMA4007	Forensic Science
47	40240047	SHYAM SUNDAR. M	SBMA4007	Forensic Science
48	40240048	ANUMEHAA. K.S	SBMA4007	Forensic Science

SBMA3011-Rehabilitation Engineering- Batch 2020-2024

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	40240001	AADHITYA. S	SBMA3011	Rehabilitation Engineering
2	40240002	ABIRAJ. B	SBMA3011	Rehabilitation Engineering
3	40240003	ANGELIN WINSLET. C	SBMA3011	Rehabilitation Engineering
4	40240004	ANUSKA CHAKRAVARTY	SBMA3011	Rehabilitation Engineering
5	40240005	AROKIYA RAHUL. W	SBMA3011	Rehabilitation Engineering
6	40240006	DANIEL. R	SBMA3011	Rehabilitation Engineering
7	40240007	DANNY ROY	SBMA3011	Rehabilitation Engineering
8	40240008	DHARANI. K	SBMA3011	Rehabilitation Engineering
9	40240009	FAZILA. A	SBMA3011	Rehabilitation Engineering
10	40240010	HARIPRIYA BHATTARU	SBMA3011	Rehabilitation Engineering
11	40240011	JAI AKASH. B	SBMA3011	Rehabilitation Engineering
12	40240012	JEFFREY DELAPERLE. S	SBMA3011	Rehabilitation Engineering
13	40240013	JEY SURYA. S	SBMA3011	Rehabilitation Engineering
14	40240014	JOHN WESLEY. I	SBMA3011	Rehabilitation Engineering
15	40240015	KAMALESH. R	SBMA3011	Rehabilitation Engineering
16	40240016	MANASA. V	SBMA3011	Rehabilitation Engineering
17	40240017	MATHANGI. B	SBMA3011	Rehabilitation Engineering
18	40240018	MEENATCHI S	SBMA3011	Rehabilitation Engineering
19	40240019	MOHAMED AZARUDEEN. S	SBMA3011	Rehabilitation Engineering
20	40240020	MOHAMMED THOUFEEQ. A	SBMA3011	Rehabilitation Engineering
21	40240021	NAJEEBA. M	SBMA3011	Rehabilitation Engineering
22	40240022	PONNI. S	SBMA3011	Rehabilitation Engineering
23	40240023	PRAKKRITH. V	SBMA3011	Rehabilitation Engineering

24	40240024	RAGHUL. A	SBMA3011	Rehabilitation Engineering
25	40240025	RENNY VALENTINA. N	SBMA3011	Rehabilitation Engineering
26	40240026	RISHON V	SBMA3011	Rehabilitation Engineering
27	40240027	ROSHAN. B	SBMA3011	Rehabilitation Engineering
28	40240028	RUFINA MAGDALIN SHALLOWM. S	SBMA3011	Rehabilitation Engineering
29	40240029	SAM JUDIT. J.V	SBMA3011	Rehabilitation Engineering
30	40240030	SARASWATHI. B	SBMA3011	Rehabilitation Engineering
31	40240031	SETHURAMAN K	SBMA3011	Rehabilitation Engineering
32	40240032	SHANUJA. M	SBMA3011	Rehabilitation Engineering
33	40240033	SHARNISHA. M	SBMA3011	Rehabilitation Engineering
34	40240034	SHRUTHI. L	SBMA3011	Rehabilitation Engineering
35	40240035	SINDHU. ELA	SBMA3011	Rehabilitation Engineering
36	40240036	SRINIVASAN. R	SBMA3011	Rehabilitation Engineering
37	40240037	SRISTI. S.V	SBMA3011	Rehabilitation Engineering
38	40240038	SRIVARI MUKUNTH. S	SBMA3011	Rehabilitation Engineering
39	40240039	SUDHISHNA. T	SBMA3011	Rehabilitation Engineering
40	40240040	SUGANTH. S	SBMA3011	Rehabilitation Engineering
41	40240041	SUSHMITHA. S	SBMA3011	Rehabilitation Engineering
42	40240042	TEJASWINI. S	SBMA3011	Rehabilitation Engineering
43	40240043	VIJAYALAKSHMI. B	SBMA3011	Rehabilitation Engineering
44	40240044	YOGAPRIYA. K	SBMA3011	Rehabilitation Engineering
45	40240045	ISHA INGROLE. R	SBMA3011	Rehabilitation Engineering
46	40240046	RANCY IRENE JOSE. J	SBMA3011	Rehabilitation Engineering
47	40240047	SHYAM SUNDAR. M	SBMA3011	Rehabilitation Engineering
48	40240048	ANUMEHAA. K.S	SBMA3011	Rehabilitation Engineering

SCHA3010 - Industrial Safety and Hazard Analysis - Batch 2021-2025

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240045	SRELAHARI B	SCHA3010	Industrial Safety and Hazard Analysis
2	41240046	SWEETHA S	SCHA3010	Industrial Safety and Hazard Analysis
3	41240048	ANTONY USHA ANU RETHI A	SCHA3010	Industrial Safety and Hazard Analysis

SECA4004 - E Health- Batch 2021-2025

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240001	AAKANKSHYA SAMANTARAY	SECA4004	eHealth
2	41240002	ABIRAMI S	SECA4004	eHealth
3	41240006	BALAJI	SECA4004	eHealth
4	41240007	BERTI MARIA PREETHA C	SECA4004	eHealth
5	41240008	CAUVIYA SRI K	SECA4004	eHealth
6	41240009	CHARAN K V	SECA4004	eHealth
7	41240010	DHARSHINI S	SECA4004	eHealth
8	41240012	INFANT SHAINNY A	SECA4004	eHealth
10	41240017	JOEL J	SECA4004	eHealth
11	41240018	KIRUTHIKA R	SECA4004	eHealth
12	41240019	LEKHA PARTHIBAN	SECA4004	eHealth
13	41240028	RANJITH B	SECA4004	eHealth
14	41240030	ROSHINI CATHERINE VERGHESE	SECA4004	eHealth
15	41240031	SANTHOSH RAJHA P	SECA4004	eHealth
16	41240032	SNEHA BABU PAUL	SECA4004	eHealth

SITA3008- Internet of Things- Batch 2021-2025

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240013	JANNE CHETAN	SITA3008	Internet of Things
2	41240024	PEDAMALLI UMAMAHESWAR REDDY	SITA3008	Internet of Things
3	41240035	SURAPUREDDY LIKITHA	SITA3008	Internet of Things
4	41240038	THATICCHARLA MANSURA	SITA3008	Internet of Things
5	41240043	MEDAPATI VENKATA SRI HARSHITHA	SITA3008	Internet of Things
6	41240049	ATTLA.SRIRAJ SHABAREESH	SITA3008	Internet of Things

SBMA4006- Medical Optics and Laser Application- Batch 2021-2025

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240003	AGALYA G	SBMA4006	Medical Optics and Laser Application
2	41240004	AMRIN MANZOOR	SBMA4006	Medical Optics and Laser Application
3	41240005	ASHWIN R	SBMA4006	Medical Optics and Laser Application
4	41240011	FARHEEN SAKKIR	SBMA4006	Medical Optics and Laser Application
5	41240014	JEFFIN JOSE	SBMA4006	Medical Optics and Laser Application
6	41240015	JENNIE ROSHINI P	SBMA4006	Medical Optics and Laser Application
7	41240020	LEKKALA HEMA	SBMA4006	Medical Optics and Laser Application
8	41240021	MUTHU VIGNESH V	SBMA4006	Medical Optics and Laser Application
9	41240022	NAGOTHU BALA AAKASH	SBMA4006	Medical Optics and Laser Application
10	41240023	NEETHISH B G	SBMA4006	Medical Optics and Laser Application
11	41240025	PRAVIN P M	SBMA4006	Medical Optics and Laser Application
12	41240027	S.RAHUL	SBMA4006	Medical Optics and Laser Application
13	41240029	RITHIKA D	SBMA4006	Medical Optics and Laser Application
14	41240033	SOMINENI NIKKHILLA CHOWDARY	SBMA4006	Medical Optics and Laser Application
15	41240034	SRINIDHI SRIDHARAN	SBMA4006	Medical Optics and Laser Application
16	41240036	SWATHI B	SBMA4006	Medical Optics and Laser Application
17	41240037	SWETHA G	SBMA4006	Medical Optics and Laser Application
18	41240039	VIDULA NANCY N	SBMA4006	Medical Optics and Laser Application
19	41240040	YUKESH KUMAR S	SBMA4006	Medical Optics and Laser Application
20	41240042	HARSHINI JOSHITHA T	SBMA4006	Medical Optics and Laser Application
21	41240044	GANGARAJU SHAMITHA	SBMA4006	Medical Optics and Laser Application

SBMA3002 - Biomems and Nanotechnology - Batch 2021-2025

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240001	AAKANKSHYA SAMANTARAY	SBMA3002	BioMEMS and nanotechnology
2	41240002	ABIRAMI S	SBMA3002	BioMEMS and nanotechnology
3	41240003	AGALYA G	SBMA3002	BioMEMS and nanotechnology
4	41240004	AMRIN MANZOOR	SBMA3002	BioMEMS and nanotechnology

5	41240005	ASHWIN R	SBMA3002	BioMEMS and nanotechnology
6	41240006	BALAJI	SBMA3002	BioMEMS and nanotechnology
7	41240007	BERTI MARIA PREETHA C	SBMA3002	BioMEMS and nanotechnology
8	41240008	CAUVIYA SRI K	SBMA3002	BioMEMS and nanotechnology
9	41240009	CHARAN K V	SBMA3002	BioMEMS and nanotechnology
10	41240010	DHARSHINI S	SBMA3002	BioMEMS and nanotechnology
11	41240011	FARHEEN SAKKIR	SBMA3002	BioMEMS and nanotechnology
12	41240012	INFANT SHAINNY A	SBMA3002	BioMEMS and nanotechnology
13	41240013	JANNE CHETAN	SBMA3002	BioMEMS and nanotechnology
14	41240014	JEFFIN JOSE	SBMA3002	BioMEMS and nanotechnology
15	41240015	JENNIE ROSHINI P	SBMA3002	BioMEMS and nanotechnology
16	41240016	JENO J	SBMA3002	BioMEMS and nanotechnology
17	41240017	JOEL J	SBMA3002	BioMEMS and nanotechnology
18	41240018	KIRUTHIKA R	SBMA3002	BioMEMS and nanotechnology
19	41240019	LEKHA PARTHIBAN	SBMA3002	BioMEMS and nanotechnology
20	41240020	LEKKALA HEMA	SBMA3002	BioMEMS and nanotechnology
21	41240021	MUTHU VIGNESH V	SBMA3002	BioMEMS and nanotechnology
22	41240022	NAGOTHU BALA AAKASH	SBMA3002	BioMEMS and nanotechnology
23	41240023	NEETHISH B G	SBMA3002	BioMEMS and nanotechnology
24	41240024	PEDAMALLI UMAMAHESWAR REDDY	SBMA3002	BioMEMS and nanotechnology
25	41240025	PRAVIN P M	SBMA3002	BioMEMS and nanotechnology
26	41240026	B PREETI	SBMA3002	BioMEMS and nanotechnology
27	41240027	S.RAHUL	SBMA3002	BioMEMS and nanotechnology
28	41240028	RANJITH B	SBMA3002	BioMEMS and nanotechnology
29	41240029	RITHIKA D	SBMA3002	BioMEMS and nanotechnology
30	41240030	ROSHINI CATHERINE VERGHESE	SBMA3002	BioMEMS and nanotechnology
31	41240031	SANTHOSH RAJHA P	SBMA3002	BioMEMS and nanotechnology
32	41240032	SNEHA BABU PAUL	SBMA3002	BioMEMS and nanotechnology
33	41240033	SOMINENI NIKKHILLA CHOWDARY	SBMA3002	BioMEMS and nanotechnology
34	41240034	SRINIDHI SRIDHARAN	SBMA3002	BioMEMS and nanotechnology
35	41240035	SURAPUREDDY LIKITHA	SBMA3002	BioMEMS and nanotechnology
36	41240036	SWATHI B	SBMA3002	BioMEMS and nanotechnology
37	41240037	SWETHA G	SBMA3002	BioMEMS and nanotechnology
38	41240038	THATICCHARLA MANSURA	SBMA3002	BioMEMS and nanotechnology
39	41240039	VIDULA NANCY N	SBMA3002	BioMEMS and nanotechnology
40	41240040	YUKESH KUMAR S	SBMA3002	BioMEMS and nanotechnology
41	41240041	ARSHATH	SBMA3002	BioMEMS and nanotechnology

		HUSSAIN N		
42	41240042	HARSHINI JOSHITHA T	SBMA3002	BioMEMS and nanotechnology
43	41240043	MEDAPATI VENKATA SRI HARSHITHA	SBMA3002	BioMEMS and nanotechnology
44	41240044	GANGARAJU SHAMITHA	SBMA3002	BioMEMS and nanotechnology
45	41240045	SRELAHARI B	SBMA3002	BioMEMS and nanotechnology
46	41240046	SWEETHA S	SBMA3002	BioMEMS and nanotechnology
47	41240048	ANTONY USHA ANU RETHI A	SBMA3002	BioMEMS and nanotechnology
48	41240049	ATTLA.SRIRAJ SHABAREESH	SBMA3002	BioMEMS and nanotechnology



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10-11-2023

STUDENT'S CIRCULAR

This is to inform that Department of Biomedical Engineering is offering Professional Elective / CBCS courses listed below for the Batches 2020-2024 and 2021-2025 during the academic year 2023-2024 EVEN Semester. The students should select one Professional elective and CBCS compulsorily from the choices given below

List of courses offered for Batch 2021-2025

S.No.	Course Code	Course Name	CBCS/Elective
1	SCSA4003	Business Analytics	CBCS
2	SCSA4007	Design and development of blockchain	CBCS
3	SITA1503	Fog and cloud computing	CBCS
4	SMEA3017	Industrial safety engineering	CBCS
5	SBMA 3010	Telehealth technology	CBCS
	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications	Elective

List of courses offered for Batch 2020-2024

S.No.	Course Code	Course Name	CBCS/Elective
1	SBMA3004	Analytical Instrumentation	Elective
2	SBAA4004	Venture Creation	Elective

Students are requested to register their names with respective year coordinators before the end date of registration (15-11-2023).


HOD/BIO MEDICAL
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DEPARTMENT OF BIOMEDICAL ENGINEERING
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Chennai - 600 079

HOD/BIO MEDICAL

Copy to:

1. Dean (Staff Affairs)
2. Dean (Student Affairs)
3. Deans of Schools
4. All HODs
5. III & IV Year UG students

List of students enrolled for Elective / CBCS during the academic year 2023-2024 (EVEN SEMESTER)

SCSA4003- Business Analytics – Batch 2021-2025

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240002	ABIRAMI S	SCSA4003	Business Analytics
2	41240003	AGALYA G	SCSA4003	Business Analytics
3	41240005	ASHWIN R	SCSA4003	Business Analytics
4	41240006	BALAJI	SCSA4003	Business Analytics
5	41240007	BERTI MARIA PREETHA C	SCSA4003	Business analytics
6	41240009	CHARAN K V	SCSA4003	Business Analytics
7	41240010	DHARSHINI S	SCSA4003	Business Analytics
8	41240012	INFANT SHAINNY A	SCSA4003	Business Analytics
9	41240013	JANNE CHETAN	SCSA4003	Business Analytics
10	41240015	JENNIE ROSHINI P	SCSA4003	Business Analytics
11	41240018	KIRUTHIKA R	SCSA4003	Business Analytics
12	41240019	LEKHA PARTHIBAN	SCSA4003	Buisness Analytics
13	41240020	LEKKALA HEMA	SCSA4003	Buisness Analytics
14	41240022	NAGOTHU BALA AAKASH	SCSA4003	Business Analytics
15	41240023	NEETHISH B G	SCSA4003	Business Analytics
16	41240024	PEDAMALLI UMAMAHESWAR REDDY	SCSA4003	Business Analytics
17	41240026	B PREETI	SCSA4003	Business Analytics
18	41240028	RANJITH B	SCSA4003	Business analytics
19	41240029	RITHIKA D	SCSA4003	Business Analytics
20	41240034	SRINIDHI SRIDHARAN	SCSA4003	Business Analytics
21	41240035	SURAPUREDDY LIKITHA	SCSA4003	Business Analytics
22	41240044	GANGARAJU SHAMITHA	SCSA4003	Business Analytics
23	41240049	ATTLA.SRIRAJ SHABAREESH	SCSA4003	Business analytics

SCSA4007- Design and development of blockchain- Batch 2021-2025

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240008	CAUVIYA SRI K	SCSA4007	Design and development of blockchain
2	41240016	JENO J	SCSA4007	Design and Development of Blockchain
3	41240017	JOEL J	SCSA4007	Design and Development of Blockchain
4	41240021	MUTHU VIGNESH V	SCSA4007	Design and Development

				of Blockchain
5	41240030	ROSHINI CATHERINE VERGHESE	SCSA4007	Design and Development of Blockchain
6	41240031	SANTHOSH RAJHA P	SCSA4007	Design and Development of Blockchain
7	41240041	ARSHATH HUSSAIN N	SCSA4007	Design and development of blockchain

SITA1503- Fog and cloud computing - Batch 2021-2025

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240043	MEDAPATI VENKATA SRI HARSHITHA	SITA1503	Fog and cloud computing

SMEA3017- Industrial safety engineering - Batch 2021-2025

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240001	AAKANKSHYA SAMANTARAY	SMEA3017	Industrial safety engineering
2	41240004	AMRIN MANZOOR	SMEA3017	industrial safety engineering
3	41240011	FARHEEN SAKKIR	SMEA3017	industrial safety engineering
4	41240033	SOMINENI NIKKHILLA CHOWDARY	SMEA 3017	Industrial safety engineering
5	41240037	SWETHA G	SMEA3017	Industrial safety engineering
6	41240038	THATICCHARLA MANSURA	SMEA3017	Industrial safety engineering
7	41240039	VIDULA NANCY N	SMEA3017	Industrial safety engineering
8	41240045	SRELAHARI B	SMEA3017	Industrial safety engineering
9	41240046	SWEETHA S	SMEA3017	Industrial safety engineering
10	41240048	ANTONY USHA ANU RETHI A	SMEA3017	Industrial safety engineering

SBMA 3010- Telehealth technology- Batch 2020-2024

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240014	JEFFIN JOSE	SBMA 3010	Telehealth technology
2	41240025	PRAVIN P M	SBMA3010	Tele health technology
3	41240027	S.RAHUL	SBMA 3010	Telehealth technology
4	41240032	SNEHA BABU PAUL	SBMA3010	Tele health technology
5	41240036	SWATHI B	SBMA3010	Telehealth technology
6	41240040	YUKESH KUMAR S	SBMA3010	Tele health technology
7	41240042	HARSHINI JOSHITHA T	SBMA 3010	Telehealth technology

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	41240001	AAKANKSHYA SAMANTARAY	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
2	41240002	ABIRAMI S	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
3	41240003	AGALYA G	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
4	41240004	AMRIN MANZOOR	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
5	41240005	ASHWIN R	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
6	41240006	BALAJI	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
7	41240007	BERTI MARIA PREETHA C	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
8	41240008	CAUVIYA SRI K	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
9	41240009	CHARAN K V	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
10	41240010	DHARSHINI S	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
11	41240011	FARHEEN SAKKIR	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
12	41240012	INFANT SHAINNY A	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
13	41240013	JANNE CHETAN	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
14	41240014	JEFFIN JOSE	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
15	41240015	JENNIE ROSHINI P	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
16	41240016	JENO J	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
17	41240017	JOEL J	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
18	41240018	KIRUTHIKA R	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications

				Applications
19	41240019	LEKHA PARTHIBAN	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
20	41240020	LEKKALA HEMA	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
21	41240021	MUTHU VIGNESH V	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
22	41240022	NAGOTHU BALA AAKASH	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
23	41240023	NEETHISH B G	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
24	41240024	PEDAMALLI UMAMAHESWAR REDDY	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
25	41240025	PRAVIN P M	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
26	41240026	B PREETI	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
27	41240027	S.RAHUL	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
28	41240028	RANJITH B	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
29	41240029	RITHIKA D	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
30	41240030	ROSHINI CATHERINE VERGHESE	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
31	41240031	SANTHOSH RAJHA P	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
32	41240032	SNEHA BABU PAUL	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
33	41240033	SOMINENI NIKKHILLA CHOWDARY	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
34	41240034	SRINIDHI SRIDHARAN	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
35	41240035	SURAPUREDDY LIKITHA	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
36	41240036	SWATHI B	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
37	41240037	SWETHA G	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications

38	41240038	THATICCHARLA MANSURA	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
39	41240039	VIDULA NANCY N	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
40	41240040	YUKESH KUMAR S	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
41	41240041	ARSHATH HUSSAIN N	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
42	41240042	HARSHINI JOSHITHA T	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
43	41240043	MEDAPATI VENKATA SRI HARSHITHA	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
44	41240044	GANGARAJU SHAMITHA	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
45	41240045	SRELAHARI B	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
46	41240046	SWEETHA S	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
47	41240048	ANTONY USHA ANU RETHI A	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications
48	41240049	ATTLA.SRIRAJ SHABAREESH	SBMA3014	Machine learning and Artificial Intelligence for Healthcare Applications

SBMA3004- Analytical Instrumentation - Batch 2020-2024

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	40240001	AADHITYA. S	SBMA3004	Analytical Instrumentation
2	40240002	ABIRAJ. B	SBMA3004	Analytical Instrumentation
3	40240003	ANGELIN WINSLET. C	SBMA3004	Analytical Instrumentation
4	40240004	ANUSKA CHAKRAVARTY	SBMA3004	Analytical Instrumentation
5	40240005	AROKIYA RAHUL. W	SBMA3004	Analytical Instrumentation
6	40240006	DANIEL. R	SBMA3004	Analytical Instrumentation
7	40240007	DANNY ROY	SBMA3004	Analytical Instrumentation
8	40240008	DHARANI. K	SBMA3004	Analytical Instrumentation
9	40240009	FAZILA. A	SBMA3004	Analytical Instrumentation
10	40240010	HARIPRIYA BHATTARU	SBMA3004	Analytical Instrumentation
11	40240011	JAI AKASH. B	SBMA3004	Analytical Instrumentation
12	40240012	JEFFREY DELAPERLE. S	SBMA3004	Analytical Instrumentation
13	40240013	JEY SURYA. S	SBMA3004	Analytical Instrumentation
14	40240014	JOHN WESLEY. I	SBMA3004	Analytical Instrumentation
15	40240015	KAMALESH. R	SBMA3004	Analytical Instrumentation

16	40240016	MANASA. V	SBMA3004	Analytical Instrumentation
17	40240017	MATHANGI. B	SBMA3004	Analytical Instrumentation
18	40240018	MEENATCHI S	SBMA3004	Analytical Instrumentation
19	40240019	MOHAMED AZARUDEEN. S	SBMA3004	Analytical Instrumentation
20	40240020	MOHAMMED THOUFEEQ. A	SBMA3004	Analytical Instrumentation
21	40240021	NAJEEBA. M	SBMA3004	Analytical Instrumentation
22	40240022	PONNI. S	SBMA3004	Analytical Instrumentation
23	40240023	PRAKKRITH. V	SBMA3004	Analytical Instrumentation
24	40240024	RAGHUL. A	SBMA3004	Analytical Instrumentation
25	40240025	RENNY VALENTINA. N	SBMA3004	Analytical Instrumentation
26	40240026	RISHON V	SBMA3004	Analytical Instrumentation
27	40240027	ROSHAN. B	SBMA3004	Analytical Instrumentation
28	40240028	RUFINA MAGDALIN SHALLOWM. S	SBMA3004	Analytical Instrumentation
29	40240029	SAM JUDIT. J.V	SBMA3004	Analytical Instrumentation
30	40240030	SARASWATHI. B	SBMA3004	Analytical Instrumentation
31	40240031	SETHURAMAN K	SBMA3004	Analytical Instrumentation
32	40240032	SHANUJA. M	SBMA3004	Analytical Instrumentation
33	40240033	SHARNISHA. M	SBMA3004	Analytical Instrumentation
34	40240034	SHRUTHI. L	SBMA3004	Analytical Instrumentation
35	40240035	SINDHU. ELA	SBMA3004	Analytical Instrumentation
36	40240036	SRINIVASAN. R	SBMA3004	Analytical Instrumentation
37	40240037	SRISTI. S.V	SBMA3004	Analytical Instrumentation
38	40240038	SRIVARI MUKUNTH. S	SBMA3004	Analytical Instrumentation
39	40240039	SUDHISHNA. T	SBMA3004	Analytical Instrumentation
40	40240040	SUGANTH. S	SBMA3004	Analytical Instrumentation
41	40240041	SUSHMITHA. S	SBMA3004	Analytical Instrumentation
42	40240042	TEJASWINI. S	SBMA3004	Analytical Instrumentation
43	40240043	VIJAYALAKSHMI. B	SBMA3004	Analytical Instrumentation
44	40240044	YOGAPRIYA. K	SBMA3004	Analytical Instrumentation
45	40240045	ISHA INGROLE. R	SBMA3004	Analytical Instrumentation
46	40240046	RANCY IRENE JOSE. J	SBMA3004	Analytical Instrumentation
47	40240047	SHYAM SUNDAR. M	SBMA3004	Analytical Instrumentation
48	40240048	ANUMEHAA. K.S	SBMA3004	Analytical Instrumentation

SBAA4004- Venture Creation – Batch 2020-2024

S. No.	Reg. No.	Name of the Student	Course Code	Course Name
1	40240001	AADHITYA. S	SBAA4004	Venture Creation
2	40240002	ABIRAJ. B	SBAA4004	Venture Creation
3	40240003	ANGELIN WINSLET. C	SBAA4004	Venture Creation
4	40240004	ANUSKA CHAKRAVARTY	SBAA4004	Venture Creation
5	40240005	AROKIYA RAHUL. W	SBAA4004	Venture Creation
6	40240006	DANIEL. R	SBAA4004	Venture Creation
7	40240007	DANNY ROY	SBAA4004	Venture Creation
8	40240008	DHARANI. K	SBAA4004	Venture Creation

9	40240009	FAZILA. A	SBAA4004	Venture Creation
10	40240010	HARIPRIYA BHATTARU	SBAA4004	Venture Creation
11	40240011	JAI AKASH. B	SBAA4004	Venture Creation
12	40240012	JEFFREY DELAPERLE. S	SBAA4004	Venture Creation
13	40240013	JEY SURYA. S	SBAA4004	Venture Creation
14	40240014	JOHN WESLEY. I	SBAA4004	Venture Creation
15	40240015	KAMALESH. R	SBAA4004	Venture Creation
16	40240016	MANASA. V	SBAA4004	Venture Creation
17	40240017	MATHANGI. B	SBAA4004	Venture Creation
18	40240018	MEENATCHI S	SBAA4004	Venture Creation
19	40240019	MOHAMED AZARUDEEN. S	SBAA4004	Venture Creation
20	40240020	MOHAMMED THOUFEEQ. A	SBAA4004	Venture Creation
21	40240021	NAJEEBA. M	SBAA4004	Venture Creation
22	40240022	PONNI. S	SBAA4004	Venture Creation
23	40240023	PRAKKRITH. V	SBAA4004	Venture Creation
24	40240024	RAGHUL. A	SBAA4004	Venture Creation
25	40240025	RENNY VALENTINA. N	SBAA4004	Venture Creation
26	40240026	RISHON V	SBAA4004	Venture Creation
27	40240027	ROSHAN. B	SBAA4004	Venture Creation
28	40240028	RUFINA MAGDALIN SHALLOWM. S	SBAA4004	Venture Creation
29	40240029	SAM JUDIT. J.V	SBAA4004	Venture Creation
30	40240030	SARASWATHI. B	SBAA4004	Venture Creation
31	40240031	SETHURAMAN K	SBAA4004	Venture Creation
32	40240032	SHANUJA. M	SBAA4004	Venture Creation
33	40240033	SHARNISHA. M	SBAA4004	Venture Creation
34	40240034	SHRUTHI. L	SBAA4004	Venture Creation
35	40240035	SINDHU. ELA	SBAA4004	Venture Creation
36	40240036	SRINIVASAN. R	SBAA4004	Venture Creation
37	40240037	SRISTI. S.V	SBAA4004	Venture Creation
38	40240038	SRIVARI MUKUNTH. S	SBAA4004	Venture Creation
39	40240039	SUDHISHNA. T	SBAA4004	Venture Creation
40	40240040	SUGANTH. S	SBAA4004	Venture Creation
41	40240041	SUSHMITHA. S	SBAA4004	Venture Creation
42	40240042	TEJASWINI. S	SBAA4004	Venture Creation
43	40240043	VIJAYALAKSHMI. B	SBAA4004	Venture Creation
44	40240044	YOGAPRIYA. K	SBAA4004	Venture Creation
45	40240045	ISHA INGROLE. R	SBAA4004	Venture Creation
46	40240046	RANCY IRENE JOSE. J	SBAA4004	Venture Creation
47	40240047	SHYAM SUNDAR. M	SBAA4004	Venture Creation
48	40240048	ANUMEHAA. K.S	SBAA4004	Venture Creation



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

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SBMA7007 (Old)	MEMS IN HEALTHCARE	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVE

- This course introduces students to Micro Electro Mechanical Systems (MEMS), small devices that perform tasks and functions involving various types of signals, and teaches the fundamentals of micromachining and microfabrication.
- Students will also learn the basics for designing and analyzing devices and systems in mechanical, electrical, fluidic, and thermal energy/signal domains, as well as basic techniques for multi-domain analysis.

UNIT1 MEMS AND MICROSYSTEMS 9Hrs.

Mems and Microsystems- General principles, advantages, Materials for bio-MEMS and their properties. Technology involved in MEMS. Fabrication techniques- Lithography- etching- Ion implantation- wafer bonding. Integrated processing- Bulk Micromachining- Surface micromachining- coating technology and CVD-LIGA process.

UNIT2 MICROSENSORS AND TISSUE MICROENGINEERING 9Hrs.

Introduction to biomimetic substrates, micro scaffolds, cellular co-cultures. Microsensors and Microactuators- working principle, types- pressure sensors, thermal sensors and actuators, piezoelectric crystals - Intelligent materials and structures, Magnetic sensors and actuators- magnetic materials used for MEMS.

UNIT3 MOEMS AND MICROFLUIDIC SYSTEM

9Hrs.

Principle of MOEMS- light modulator, beam splitter, digital micro mirror device, light detectors and optical switch. Microfluidic System- Fluid actuation method, dielectrophoresis, microfluid dispenser, microneedle, micro pumps. Applications of BioMEMS -Healthcare, drug delivery, micro total analysis system detection and measurement methods,

UNIT4 INTRODUCTION TO NANOTECHNOLOGY 9Hrs.

Essence of Nanotech, Nanofying electronics, Properties of nanomaterials, metal nano clusters, semiconductor nanoparticles, nanocomposites. Introduction to carbon nanostructure, carbon molecules, carbon clusters, nanotubes-application.

UNIT5 MEDICAL APPLICATIONS OF NANOTECHNOLOGY 9 Hrs.

Nanotechnology and Biomedicine- Drug synthesis and delivery- nano fabrication methods- biomimetic nanodevices nanomaterials in human body- toxicity in nanomaterials.

Max. 45 Hours

TEXT / REFERENCE BOOKS

- Tai Ram Hsu, Mems and Microsystems, Design and Manufacture, TMH 2008.
- Mohammed had-el-hak, MEMS Introduction & Fundamentals, CRC Press, 2005.
- Marc J. Madou, Fundamentals of Microfabrication and Nanotechnology, Third Edition, 2011, CRC Press. ISBN 9780849331800
- Harsingh Nalwa, Encyclopedia of Nanoscience and Nanotechnology, American Scientific Publishers. 2007.
- Neelina Malsch, Biomedical Nanotechnology. CRC, 2005
- Richard Booker and Earl Boysen, Nanotechnology For Dummies, John Wiley & Sons, 2011

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3Hrs.

PART A: 6 Questions of 5 Marks each- No Choice 30 Marks

PART B: 2 Questions from each unit of internal choice, carrying 14 Marks each 70 Marks

SBMB7006	MEMS AND NANOTECHNOLOGY IN HEALTH CARE	L	T	P	EL	C	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVE

- To understand Various MEMS fabrication techniques
- Application of MEMS in different field of medicine.
- To know the underlying concept in engineering and implement in nano centric applications

UNIT- I MEMS & FABRICATION

9 Hrs

MEMS and Microsystems, Materials for MEMS-Active Substrate Materials Silicon and Its Compounds, Silicon Piezo resistors, Gallium Arsenide, Quartz Polymers Lithography Etching and Its Types, Wafer Bonding, Micromachining -Bulk, Surface Micromachining, LIGA Process.

UNIT II MICROFLUIDIC SYSTEMS

9 Hrs

Fluid Dynamics, Continuity, Momentum Equation, Equation of Motion Laminar air Flow In- Circular, Circular Conducts, Flow in Micro conducts in Sub micro meter and Nanoscale. Microscale Fluid Expression for Liquid Flow In A Channel, Fluid Methods Actuation, Dielectrophoresis, Microfluid Dispenser, Microneedle, Micropump, Continuous flow System, Micro mixers.

UNIT III APPLICATIONS OF MEMS IN MEDICINE

9 Hrs

CAD for MEMS Biological MEMS Materials Polymers Based Gas Sensor Microbial Analysis Systems Detection and Measurement Methods Microsystems Approaches To PCR, DNA Sensor Drug Delivery Types of Reservoirs CARDIOMEMS Case Study Design of Sensor in Health Care Introduction To 3D Printing.

UNIT IV OVERVIEW OF NANOPARTICLES

9 Hrs

Nanotechnology from medical perspective Different Types of Nano biomaterials And Nanostructure Interactions Synthesis and Characterization of Smart Nano materials Surface Modification Biofunctionalization of Nano materials.

UNIT V NANOTECHNOLOGY IN HEALTH CARE

9 Hrs

Nano shells, Nanopores, Carbon Nanotubes, Synthesis and Monitoring of Antigen Antibody Reactions. Nanowires, Quantum Dots and Biomedical Applications Nanorobots in Surgery Nano oncology Nano neurology, Nano cardiology, Nano orthopedies and Nano Ophthalmology.

COURSE OUTCOMES

45Hrs

On completion of the course, students will be able to

- CO1: Understand the Mems Fabrication Processes and Characterization of Various Mems Materials
- CO2: Applying the Concepts to The Design of Different Types of Microsystems.
- CO3: Design the Procedure Adopted for Mems Device Towards Health Care Applications.
- CO4: Interpret the Latest Scientific Development and Discoveries in The Field of Nanomedicine.
- CO5: Examine the New Findings and Implement the Perspective in The Field of Nanoscience.
- CO6: Create New Approaches in Nanotechnology That Can Be Used in Biomedical Therapies.

TEXT BOOK / REFERENCE BOOK

1. Nano: The Essentials: T. Pradeep. McGraw - Hill education, First edition, 2017.
2. Carola Leuschner, Nanofabrication towards Biomedical Applications, Techniques, Tools, Applications and Impact. 2005, Wiley - VCH.
3. Kewal K. Jain, The Handbook of Nanomedicine. Humana Press, (2008).
4. Wanjun Wang, Stephen A. Soper, Bio MEMS: Technologies and applications, CRC Press, New York, 2007
5. Marc J. Madou, Fundamentals of micro fabrication: the science of miniaturization, CRC Press, 2002.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 6 Questions of 5 marks each - No choice

PART B: 2 Questions from each unit with internal choice, each carrying 14 marks

30 Marks

S.No.	CourseCode	CourseName	DeletedTopics	AddedTopics
1	SBMB7006	MEMS & NANOTECHNOLOGY IN HEALTH CARE	General principles, advantages, Materials for bio-MEMS and their properties. Technology involved in MEMS. Fabrication techniques materials used for MEMS. UNIT2 MICROSENSORS AND TISSUE MICROENGINEERING Introduction to biomimetic substrates, microcaffolds, cellular co-cultures. Microsensors and Microactuators- working principle, types- pressure sensors, thermal sensors and actuators, piezoelectric crystals- Intelligent materials and structures, Magnetic sensors and actuators- magnetic materials used for MEMS. Principle of MOEMS- light modulator, beam splitter, digital micro mirror device, light detectors and optical switch UNIT5 MEDICAL APPLICATIONS OF NANOTECHNOLOGY Nanotechnology and Biomedicine- Drug synthesis and delivery-- nano fabrication methods- biomimetic nanodevices nanomaterials in human body- toxicity in nanomaterials.	MEMS and Microsystems, Materials for MEMS-Active Substrate Materials Silicon and Its Compounds, Silicon Piezo resistors, Gallium Arsenide, Quartz Polymers Lithography Etching and Its Types, Wafer Bonding, Micromachining UNIT III APPLICATIONS OF MEMS IN MEDICINE CAD for MEMS Biological MEMS Materials Polymers Based Gas Sensor Microbial Analysis Systems Detection and Measurement Methods Microsystems Approaches To PCR, DNA Sensor Drug Delivery Types of Reservoirs CARDIOMEMS Case Study Design of Sensor in Health Care Introduction To 3D Printing. UNIT V NANOTECHNOLOGY IN HEALTH CARE 9 Hrs Nano shells, Nanopores, Carbon Nanotubes, Synthesis and Monitoring of Antigen Antibody Reactions. Nanowires, Quantum Dots and Biomedical Applications Nanorobots in Surgery Nanotechnology Nano neurology, Nano cardiology,

SBMA7005 (Old)	HOSPITAL EQUIPMENT MAINTENANCE & SAFETY	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVE

- To train students and thus provide skilled technologists to the medical community. This course aims to give a thorough grounding in issues of safety for maintenance personnel working in medical establishments. The course will emphasize both theoretical and practical parts.

UNIT1 EQUIPMENT MANAGEMENT

9Hrs.

Organizing the maintenance operation, biomedical equipment procurement procedure, proper selection, compatibility, testing and installation, purchase and contract procedure, trained medical staff, on proper use of equipment and operating instructions. Maintenance job planning, preventive maintenance, maintenance budgeting, contract maintenance.

UNIT2 LOGISTIC SUPPORT & RELIABILITY

9 Hrs.

Maintenance equipment and Tools, failure analysis, spare parts and maintenance materials. Reliability fundamentals.

UNIT3 ELECTROMAGNETIC INTERFERENCE IN HOSPITALS

9Hrs.

Principles of EMI, computation of EMI, Method of suppressing and isolating the unit from interference.

UNIT4 HOSPITAL SAFETY

9Hrs.

Radiation safety, Safety precautions, Hazardous effects of radiation, allowed levels of radiation, ICRP regulations for radiation safety.

UNIT5 ELECTRICAL & FIRE SAFETY

9Hrs.

Sources of shocks, macro & micro shocks, monitoring and interrupting the Operation from leakage current- Elements of fire, causes of fire & fire protection.

Max. 45 Hours

TEXT / REFERENCE BOOKS

1. Maintenance and repair of laboratory diagnostic imaging and hospital equipment, WHO 2010 (revised)
2. Antony Kelly, Maintenance Planning & Control Butterworth, London, 2004.
3. Hans Pleiffveradamann(ed), Hospital Engineering in developing countries, GTZ report Eschborn, 2006.
4. Webster J. and Albert M. Cook, Clinical Engg, Principles & Practices, Prentice Hall Inc. Englewood Cliffs, New Jersey, 2009.
5. B.M. Sakharkar, Principles of Hospital administration and Planning, Jaypee Brothers, Medical Publishers (P) Ltd. 1st edition 2007.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3Hrs.

PART A: 6 Questions of 5 Marks each- No Choice

Marks

PART B: 2 Questions from each unit of internal choice, carrying 14 Marks each

SBMB7005 (Revised)	HOSPITAL EQUIPMENT MAINTENANCE & SAFETY					L	T	P	EL	C	Total Marks
						3	0	0	0	3	100

COURSE OBJECTIVE

Ø To Focus on the acquisition of skills necessary to perform inspection, installation, preventative maintenance and troubleshooting of Basic Clinical Equipment

Ø To facilitate the related medical device/ electronic systems, including appropriate documentation for all service activities and training the hospital staff.

UNIT I EQUIPMENT MANAGEMENT

9 Hrs.

Organizing the maintenance operation, biomedical equipment procurement procedure, proper selection, compatibility, testing and installation, purchase and contract procedure, trained medical staff, on proper use of equipment and operating instructions. Maintenance job planning, preventive maintenance, maintenance budgeting, contract maintenance.

UNIT II LOGISTIC SUPPORT & RELIABILITY

9 Hrs.

Maintenance equipment and Tools, failure analysis, spare parts and maintenance materials. Reliability fundamentals.

UNIT III CLINICAL ENGINEERING

9 Hrs.

Role to be performed in Hospital, Manpower & Market, Professional Registration, Maintenance of Hospital support system, surveillance network, electric power management, Medical gas production, waste disposal, inventory control. Case study: RF ID tag for inventory.

UNIT IV HOSPITAL SAFETY

9 Hrs.

Radiation safety, Operations of safety devices, Hazardous effects of radiation, radiation measurements, ICRP regulations for radiation safety.

UNIT V ELECTRICAL & FIRE SAFETY

9 Hrs.

Sources of shocks, macro & micro shocks, monitoring and interrupting the Operation from leakage current- Elements of basic fire aid, causes of fire & fire protection Case study: Safety awareness

COURSE OUTCOMES

45Hrs

On completion of the course, students will be able to

CO1: Facilitate Biomedical Instrumentation Services for basic clinical equipment

CO2: understands the strategy of medical equipment maintenance and various options for medical equipment maintenance in the hospital.

CO3: Demonstrate good communication, communicate accurately and appropriately in the role of Medical Equipment Technician

CO4: Deliver and set-up medical equipment

CO5: Calibrate and help in equipment maintenance

CO6: Maintain a safe, healthy, and secure working environment

TEXT BOOK / REFERENCE BOOK

1. Maintenance and repair of laboratory diagnostic imaging and hospital equipment, WHO 2010 (revised) Antony Kelly, Maintenance Planning & Control Butterworth, London, 2004.

2. Hokey Min, "Healthcare Supply Chain Management: Basic Concepts and principles", Business expert press, New York, 2014
3. Syed Amin Tabish "Hospital and Health services Administration Principles and Practices" Oxford Press, New Delhi, 2016
4. M. A. George, The Hospital Administrator, Jaypee Publications, 2015
5. Sanskriti Sharma, Essentials for Hospital Support Services and Physical infrastructure, Publications 2015

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam

Duration: 3 Hrs.

PART A: 6 Questions of 5 marks each - No choice **30 Marks**

PART B: 2 Questions from each unit with internal choice, each carrying 14 marks

70 Marks

S.No.	CourseCode	CourseName	DeletedTopics	AddedTopics
1	SBMB7005	HOSPITAL EQUIPMENT MAINTENANCE & SAFETY	UNIT 3 ELECTROMAGNETIC INTERFERENCE IN HOSPITALS Principles of EMI, computation of EMI, Method of suppressing and isolating the unit from interference.	UNIT III CLINICAL ENGINEERING Role to be performed in Hospital, Manpower & Market, Professional Registration, Maintenance of Hospital support system, surveillance network, electric power management, Medical gas production, waste disposal, inventory control. Case study: RF ID tag for inventory.

SBMA7001 (Old)	BIOMATERIALS AND ARTIFICIAL ORGANS	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVE

- This course is designed to provide a general understanding of the multidisciplinary field of biomaterials.
- Current applications of biomaterials will be evaluated to provide an understanding of material bulk and surface properties, degradation processes, and the clinical context of their use.
- The general concepts of artificial organs learned in this course will further extend the understanding of the interactions at the interface of material and biological systems.

UNIT 1 INTRODUCTION

9Hrs.

Overview of Biomaterials, metallic biomaterials, Ceramic biomaterials, Polymeric biomaterials, Composite biomaterials, biodegradable polymers, Deterioration of polymers.

UNIT 2 TISSUE RESPONSE TO IMPLANTS

9Hrs.

Tissue grafts, Hard tissue replacements-Wires, pins and Screws, Joint replacements-Upper extremity and Lower extremity, Soft tissue replacements-sutures, skin and maxillofacial implants, Normal Wound healing process, Blood Compatibility

UNIT 3 CHARACTERIZATION OF OPHTHALMIC AND DENTAL MATERIALS

9 Hrs.

Corrosion of metallic implants, Contact lenses, Optical implants, Eye Shields, Artificial tears, Dental materials, types and designs, Oral implants, use of collagen in dentistry

UNIT 4 BLOOD INTERFACING IMPLANTS

9Hrs.

Neural and neuromuscular implants, Vascular implants, heart valve implants, heart and lung assist devices, artificial heart, cardiac pacemakers, Cardiac defibrillators, artificial kidney, Dialysis, Artificial blood.

UNIT 5 TRANSPLANTS

9Hrs.

Overview, immunological considerations, individual organs-kidney, liver, heart and lung, bone, cornea, Skin and hair, Pancreas, Mechanism of rejection, Regeneration and ethical considerations, Immunosuppressive drugs.

Max. 45 Hours

TEXT / REFERENCE BOOKS

1. JDBronzino, Biomedical Engineering handbook, CRC Press/IEEE Press, Volume 2, 2nd edition, 2000.
2. RSKhandpur, Handbook of Biomedical Instrumentation, Tata McGraw Hill, -2nd edition 2003
3. Joon B Park, Biomaterials-An Introduction, Plenum press, New York, -2nd edition 1992.
4. Sujata V Bhat, Biomaterials-Narosa Publishing House Pvt Ltd, 2nd edition, 2009

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max.Marks:100

Exam Duration:3Hrs.

PART A: 6 Questions of 5 Marks each-No Choice

30 Marks

PART B: 2 Questions from each unit of internal choice, carrying 14 Marks each

70 Marks

SBMB7001 (Revised)	BIOMATERIALS AND ARTIFICIAL ORGANS	L	T	P	EL	C	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVE

- Ø To provide a general understanding of the multidisciplinary field of biomaterials.
- Ø To provide an understanding of material bulk and surface properties, degradation processes, various biological responses to the materials.
- Ø The general concepts of artificial organs learned in this course will further extend the understanding about the interactions of material and biological systems

UNIT-I INTRODUCTION TO BIOMATERIALS

9 Hrs

Overview of Biomaterials, mechanical properties, surface chemistry of materials, surface modification, Corrosion of metallic implants, Tissue Reaction, Bio Compatibility. metallic biomaterials, Ceramic biomaterials, Polymeric biomaterials, Composite biomaterials.

UNIT-II TISSUE REPLACEMENTS

9 Hrs

Hard tissue replacements - Wires, pins and Screws, Joint replacements - Upper extremity and Lower extremity, Soft tissue replacements - sutures, Tapes, Staples, Adhesives, Normal Wound healing process.

UNIT-III OPHTHALMIC AND ORAL

9 Hrs

Contact lenses, Optical implants, Eye Shields, Artificial tears, Dental materials, types and designs, Oral implants, use of collagen in dentistry and maxillofacial implants.

UNIT-IV BLOOD INTERFACING IMPLANTS

9 Hrs

Artificial blood, Neural and neuro muscular implants, Cardiac Implants, heart valve implants, heart and lung assist devices, artificial heart, cardiac pacemakers, Cardiac defibrillators, artificial kidney, Dialysis system.

UNIT-V STERILIZATION OF IMPLANT

9 Hrs

Sterilization techniques: Process and mechanism of action of steam sterilization, radiation sterilization, electron beam sterilization, ethylene oxide, chlorine dioxide and plasma gas sterilization, filter sterilization.

COURSE OUTCOMES

45Hrs

On completion of the course, students will be able to

- CO1: Understand the basic principles in material science and their contribution towards Biomedical engineering
- CO2: Analyze different types of materials and apply in designing a device.
- CO3: Select the materials for designing an implant in tissue replacement.
- CO4: Acquire knowledge about different types of artificial organs and their implantation.
- CO5: Identify significant gap required to overcome challenges and further developments.
- CO6: Implement the artificial organs to replace malfunctioning of natural organs.

TEXT BOOK / REFERENCE BOOK

1. JD Bronzino, Biomedical Engineering hand book, CRC Press/IEEE Press, Volume 2, 2nd Edition, 2000.
2. Sujata V Bhat, Biomaterials - Narosa Publishing House Pvt. Ltd., 2nd Edition, 2009.
3. Larry L. Hench and Julian R. Jones, Biomaterials, Artificial organs and Tissue Engineering, 2005.
4. Anne Booth Sterilization of Medical Devices Publisher CRC Press 2008

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 6 Questions of 5 marks each - No choice **30 Marks**

PART B: 2 Questions from each unit with internal choice, each carrying 14 marks **70 Marks**

S.No.	CourseCode	CourseName	DeletedTopics	AddedTopics
1	SBMB7001	BIOMATERIALS AND ARTIFICIAL ORGANS	Artificial blood. UNIT 5 TRANSPLANTS Overview, Immunological considerations, individual organs-kidney, liver, heart and lung, bone, cornea, Skin and hair, Pancreas, Mechanism of allograft rejection, Regeneration and ethical considerations, Immunosuppressive drugs.	UNIT-V STERILIZATION OF IMPLANT Sterilization techniques: Process and mechanism of action of steam sterilization, radiation sterilization, electron beam sterilization, ethylene oxide, chlorine dioxide and plasma gas sterilization, filter sterilization.

SBMA3014	MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE FOR HEALTHCARE APPLICATION					L	T	P	EL	C	Total Marks
						2	0	2	0	3	100

COURSE OBJECTIVE

- To understand the concepts of Machine Learning
- To get introduced to Artificial Intelligence techniques
- To apply ML in healthcare data

UNIT- I INTRODUCTION TO MACHINE LEARNING

9 Hrs

Machine Learning-Applications - Types of Machine Learning - Training, Testing, - Machine Learning process - Variance - Bias - Training Error - Testing Error - Overfitting - Underfitting - Gradient Descent - Accuracy - Precision - Recall - Confusion Matrix.

UNIT- II NEURAL NETWORKS

9 Hrs

Structure of a brain - Artificial Neural Network - Perceptron - Activation function - Sigmoid - Relu - Tanh - Multilayer perceptron - Feed forward propagation - Backpropagation - Training process in neural network-Introduction to Adaptive resonance theory and Self-organizing map.

UNIT- III SUPERVISED AND UNSUPERVISED LEARNING

9 Hrs

Supervised Learning- Regression - Linear Models for Regression - Classification - Logistic Regression - Classification Models - KNN Classification - Naïve Bayes Classification - Decision Tree Classification - Support Vector Machine - Ensemble Learning - Random Forest-Clustering - k-means clustering.

UNIT-IV INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND PROBLEM-SOLVING AGENT

9 Hrs

Introduction-Definition - Future of Artificial Intelligence - Characteristics of Intelligent Agents-Typical Intelligent Agents - Problem-Solving Approach to Typical AI Problems- Introduction to Knowledge Representation and Reasoning- Introduction to Decision Theory.

UNIT-V HEALTH CARE APPLICATIONS

9 Hrs

Case Studies and use cases- Disease Personalized medicine- patient monitoring- Robotic surgery- Precision medicine- Medical Imaging Diagnosis Signal Classification -Oncology research- Bio Predictive Analysis- Simple programs for classification of biosignals.

COURSE OUTCOMES

45 Hrs

- On completion of the course, students will be able to
- CO1: Understand the basics of Machine Learning
 - CO2: Acquire knowledge of training data using Neural Networks
 - CO3: Analyze the Supervised Learning and Unsupervised learning methods
 - CO4: Explore the principles of Artificial Intelligence
 - CO5: Explore techniques for analyzing and classifying medical data.
 - CO6: Design an algorithm for anomaly detection using a machine-learning algorithm

TEXTBOOK / REFERENCE BOOK

- Burkov, Andriy, "The Hundred-page Machine Learning Book, 2019.
- Theobald, Oliver., "Machine Learning for Absolute Beginners: A Plain English Introduction", Scatterplot Press, 2017. .
- Maini, Vishal, and Sabri, Samer. Machine Learning For Humans: Introduction to Machine Learning with Python. Romania, Alanna Maldonado, 2023
- Stephen Lucci and Danny Kopec," Artificial Intelligence in the 21st Century, Second Edition, Mercury Learning and Information, 2015.
- David L. Poole and Alan K. Mackworth, "Artificial Intelligence: Foundations of Computational Agents", Second Edition, Cambridge University Press, 2017. Patterson, Adam Gibson "Deep Learning: A Practitioner's Approach", O'Reilly Media, 2017

END-SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100 Exam Duration: 3 Hrs.

PART A: 10 Questions of 2 marks each - No choice 20 Marks

PART B: 2 Questions from each unit with internal choice, each carrying 16 marks 80 Marks