VALUE ADDED COURSE

ON

BIOSENSORS

(Academic Year: 2024-2025)

Course Duration : 30 Hours

Course Coordinator : Dr. Manoj Kumar Yadav

OFFERED BY

Department of Biomedical Engineering



BIOSENSORS

COURSE SYLLABUS

MODULE-1 INTRODUCTION

Overview of Biosensors: Definition and History, Components of Biosensors: Bioreceptor, Transducer, and Signal Processor, General Working Principle, Classification of Biosensors: Based on Bioreceptor Type: Enzymatic, Immunosensors, DNA Biosensors, etc., Based on Transduction Principle: Electrochemical, Optical, Thermal, Piezoelectric. Performance Parameters: Sensitivity, Selectivity, Response Time, Limit of Detection.

MODULE-2 TYPES AND APPLICATIONS OF BIOSENSORS

Electrochemical Biosensors: Principle and Working, Applications in Glucose Monitoring and Disease Diagnosis, Optical Biosensors: Types: Fluorescence-Based, SPR Sensors, Applications in Drug Discovery and Environmental Monitoring.

Wearable Biosensors: Sensors in Smartwatches and Wearable Devices, Real-Time Health Monitoring, Emerging Applications: Biosensors in Food Safety, Biodefense, and Industrial Bioprocessing.

MODULE-3 DESIGN AND FABRICATION OF BIOSENSORS

Material Selection: Bioreceptor Immobilization Techniques, Nanomaterials in Biosensors, Fabrication Techniques: Microfluidics and Lab-on-a-Chip Devices, Additive Manufacturing and 3D Printing in Biosensor Development, Integration with Electronics: Signal Amplification and Noise Reduction, Wireless Data Transmission in Modern Biosensors, Case Studies: Success Stories in Biosensor Development (e.g., Glucometers, COVID-19 Rapid Tests), Challenges and Future Trends in Biosensors.



BIOSENSORS

LECTURE PLAN

MODULES	LECTURE SESSIONS	TOPICS	PEDAGOGY
I	1-10	INTRODUCTION Overview of Biosensors: Definition and History, Components of Biosensors: Bioreceptor, Transducer, and Signal Processor, General Working Principle, Classification of Biosensors: Based on Bioreceptor Type: Enzymatic, Immunosensors, DNA Biosensors, etc., Based on Transduction Principle: Electrochemical, Optical, Thermal, Piezoelectric. Performance Parameters: Sensitivity, Selectivity, Response Time, Limit of Detection	**Chalk & Talk/ PPT**
II	11-20	**TYPES AND APPLICATIONS OF BIOSENSORS** Electrochemical Biosensors: Principle and Working, Applications in Glucose Monitoring and Disease Diagnosis, Optical Biosensors: Types: Fluorescence-Based, SPR Sensors, Applications in Drug Discovery and Environmental Monitoring Wearable Biosensors: Sensors in Smartwatches and Wearable Devices, Real-Time Health Monitoring, Emerging Applications: Biosensors in Food Safety, Biodefense, and Industrial Bioprocessing	**Chalk & Talk/ PPT**
III	21-30	DESIGN AND FABRICATION OF BIOSENSORS Material Selection: Bioreceptor Immobilization Techniques, Nanomaterials in Biosensors, Fabrication Techniques: Microfluidics and Lab-on-a-Chip Devices, Additive Manufacturing and 3D Printing in Biosensor Development, Integration with Electronics: Signal Amplification and Noise Reduction, Wireless Data Transmission in Modern Biosensors, Case Studies: Success Stories in Biosensor Development (e.g., Glucometers, COVID-19 Rapid Tests), Challenges and Future Trends in Biosensors	**Chalk & Talk/ PPT**

Attendance List: Value Added Course

BIOSENSORS

Session:2024-2025 **Duration: 13 January 2025 - 03 March 2025** **Duration: 30 hours**

S. No.	Student Name	Registration No.	Program Name	13-Jan	16-Jan	20-Jan	23-Jan	27-Jan	30-Jan	03-Feb	06-Feb	10-Feb	13-Feb	17-Feb	20-Feb	24-Feb	27-Feb	03-Mar
1	RAGHAV GAUTAM	10421210001	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P
2	KUSHAGRA DWIVEDI	10421210002	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
3	ABHINEET MISHRA .	10421210003	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4	SOHANA BHATIA	10422210001	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	SOUMENDRA NARAYAN	10422210002	B.Tech.-Electronics & Communication Engine	P	P	A	P	A	P	P	P	P	P	P	P	P	P	P
6	K SABARI KUMAR	10422210003	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	SHUBHANKAR SHUKLA	10422210004	B.Tech.-Electronics & Communication Engine	A	P	P	P	P	P	P	P	A	P	P	A	P	P	P
8	SANKALP TIWARI	10422210007	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	YASH	10423210001	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P
10	ARPIT GUPTA	10423210002	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11	RITIKA SHARMA	10423210004	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P
12	PRATEEK SHARMA	10423210005	B.Tech.-Electronics & Communication Engine	P	P	P	A	P	P	P	P	P	A	P	P	P	P	P
13	VAIZURS SRINIVASA AB	10423210006	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P
14	MOHAMMED ALNABIGH	10423210007	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P
15	SHARAN PRUTHI	10423210008	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A
16	KARTIK DUHAN	10423210009	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P
17	ANIMESH SHUKLA	10423210010	B.Tech.-Electronics & Communication Engine	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P
18	SHIVANSH HOSALLI	10423210011	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P
19	MANISH KUMAR	10423210012	B.Tech.-Electronics & Communication Engine	P	P	P	A	P	P	P	P	P	A	P	P	P	P	P
20	ROHIN SAPRA	10424210002	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
21	UTTAM SINGH BALIYAN	10424210003	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
22	JEENAL MAAN	10424210005	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P
23	YASH RANA	10424210006	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
24	LAKSH VOHRA	10424210007	B.Tech.-Electronics & Communication Engine	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P
25	SUJAL KUMAR	10424210008	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A
26	GAGANDEEP SINGH PAN	10424210009	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
27	CHIRAG BHARDWAJ	10424210010	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
28	AYUSH	10424210011	B.Tech.-Electronics & Communication Engine	P	P	P	P	P	P	A	P	A	P	P	A	P	P	P
29	VARUN KUNDNANI	10424210012	B.Tech.-Electronics & Communication Engine	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P
30	MEGHA GUPTA	10424210025	B.Tech.-Electronics & Communication Engine	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P
31	ANKIT	10521210001	B.Tech.-Electrical & Electronics Engineering	P	P	P	P	P	P	P	P	P	A	P	P	P	A	P
32	G PRAMOD	10521210002	B.Tech.-Electrical & Electronics Engineering	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
33	ADITI GUPTA	10521210003	B.Tech.-Electrical & Electronics Engineering	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
34	LAKSHAY SHARMA	10521210004	B.Tech.-Electrical & Electronics Engineering	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
35	AYUSH SINGH	10522210001	B.Tech.-Electrical & Electronics Engineering	P	P	P	P	P	P	A	P	A	P	P	P	P	P	P
36	AMAR YASIER ABDO KH	10522210003	B.Tech.-Electrical & Electronics Engineering	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P
37	RANANJAY SINGH	10522210004	B.Tech.-Electrical & Electronics Engineering	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
38	ADITYA SHARMA	10523210001	B.Tech.-Electrical & Electronics Engineering	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P
39	SOUGAIJAM SWADESH	10523210002	B.Tech.-Electrical & Electronics Engineering	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P

Evaluation Sheet of Value Added Course

BIOSENSORS

Session: 2024-2025 **Duration: 13 January 2025 - 03 March 2025**

S. No.	Student Name	Registration No.	Program Name	Class Test MM: 15	Quiz MM:15	Presentation MM:15	Assignments MM:15	Total Marks MM:60
1	RAGHAV GAUTAM	10421210001	B.Tech.-Electronics & Communication Engine	12	13	14	13	52
2	KUSHAGRA DWIVEDI	10421210002	B.Tech.-Electronics & Communication Engine	15	12	13	14	54
3	ABHINEET MISHRA .	10421210003	B.Tech.-Electronics & Communication Engine	12	15	15	15	57
4	SOHANA BHATIA	10422210001	B.Tech.-Electronics & Communication Engine	13	12	14	15	54
5	SOUMENDRA NARAYAN ROY	10422210002	B.Tech.-Electronics & Communication Engine	14	11	14	12	51
6	K SABARI KUMAR	10422210003	B.Tech.-Electronics & Communication Engine	15	14	12	13	54
7	SHUBHANKAR SHUKLA	10422210004	B.Tech.-Electronics & Communication Engine	12	14	15	14	55
8	SANKALP TIWARI	10422210007	B.Tech.-Electronics & Communication Engine	12	12	11	12	47
9	YASH	10423210001	B.Tech.-Electronics & Communication Engine	15	14	14	11	54
10	ARPIT GUPTA	10423210002	B.Tech.-Electronics & Communication Engine	11	12	14	14	51
11	RITIKA SHARMA	10423210004	B.Tech.-Electronics & Communication Engine	14	11	12	14	51
12	PRATEEK SHARMA	10423210005	B.Tech.-Electronics & Communication Engine	14	14	15	12	55
13	VAIZURS SRINIVASA ABHILAASH	10423210006	B.Tech.-Electronics & Communication Engine	12	14	12	15	53
14	MOHAMMED ALNABIGHA KHAFALLA I	10423210007	B.Tech.-Electronics & Communication Engine	11	12	15	11	49
15	SHARAN PRUTHI	10423210008	B.Tech.-Electronics & Communication Engine	14	15	12	14	55
16	KARTIK DUHAN	10423210009	B.Tech.-Electronics & Communication Engine	15	11	14	15	55
17	ANIMESH SHUKLA	10423210010	B.Tech.-Electronics & Communication Engine	11	15	12	12	50
18	SHIVANSH HOSALLI	10423210011	B.Tech.-Electronics & Communication Engine	14	12	15	13	54
19	MANISH KUMAR	10423210012	B.Tech.-Electronics & Communication Engine	14	12	12	14	52
20	ROHIN SAPRA	10424210002	B.Tech.-Electronics & Communication Engine	14	14	13	15	56
21	UTTAM SINGH BALIYAN	10424210003	B.Tech.-Electronics & Communication Engine	14	11	14	13	52
22	JEENAL MAAN	10424210005	B.Tech.-Electronics & Communication Engine	14	14	11	13	52
23	YASH RANA	10424210006	B.Tech.-Electronics & Communication Engine	12	14	13	11	50
24	LAKSH VOHRA	10424210007	B.Tech.-Electronics & Communication Engine	13	12	14	10	49
25	SUJAL KUMAR	10424210008	B.Tech.-Electronics & Communication Engine	14	15	12	13	54

26	GAGANDEEP SINGH PANESAR	10424210009	B.Tech.-Electronics & Communication Engine	15	12	14	14	55
27	CHIRAG BHARDWAJ	10424210010	B.Tech.-Electronics & Communication Engine	13	12	14	11	50
28	AYUSH	10424210011	B.Tech.-Electronics & Communication Engine	14	15	14	14	57
29	VARUN KUNDNANI	10424210012	B.Tech.-Electronics & Communication Engine	15	12	12	14	53
30	MEGHA GUPTA	10424210025	B.Tech.-Electronics & Communication Engine	12	13	15	12	52
31	ANKIT	10521210001	B.Tech.-Electrical & Electronics Engineering	12	12	12	15	51
32	G PRAMOD	10521210002	B.Tech.-Electrical & Electronics Engineering	13	11	13	11	48
33	ADITI GUPTA	10521210003	B.Tech.-Electrical & Electronics Engineering	14	14	14	13	55
34	LAKSHAY SHARMA	10521210004	B.Tech.-Electrical & Electronics Engineering	13	12	12	13	50
35	AYUSH SINGH	10522210001	B.Tech.-Electrical & Electronics Engineering	14	12	12	14	52
36	AMAR YASIER ABDO KHALAFALLA	10522210003	B.Tech.-Electrical & Electronics Engineering	13	11	14	14	52
37	RANANJAY SINGH	10522210004	B.Tech.-Electrical & Electronics Engineering	12	10	13	14	49
38	ADITYA SHARMA	10523210001	B.Tech.-Electrical & Electronics Engineering	13	11	13	13	50
39	SOUGAIJAM SWADESH	10523210002	B.Tech.-Electrical & Electronics Engineering	14	12	12	14	52



NAAC ACCREDITED A+ GRADE

SRM UNIVERSITY
DELHI-NCR, SONEPAT

CERTIFICATE

OF COMPLETION

PRESENTED TO

RAGHAV GAUTAM

Reg. No. 10421210001 for completing a value-added course of 30 hours on BIOSENSORS offered by the Department of Biomedical Engineering from 13 January 2025 to 03 March 2025.

Dean Academic Affairs

NAAC ACCREDITED A+ GRADE

SRM UNIVERSITY
DELHI-NCR, SONEPAT

CERTIFICATE

OF COMPLETION

PRESENTED TO

KARTIK DUHAN

Reg. No. 10423210009 for completing a value-added course of 30 hours on BIOSENSORS offered by the Department of Biomedical Engineering from 13 January 2025 to 03 March 2025.

Dean Academic Affairs

NAAC ACCREDITED A+ GRADE

SRM UNIVERSITY
DELHI-NCR, SONEPAT

CERTIFICATE

OF COMPLETION

PRESENTED TO

AYUSH SINGH

Reg. No. 10522210001 for completing a value-added course of 30 hours on BIOSENSORS offered by the Department of Biomedical Engineering from 13 January 2025 to 03 March 2025.

Dean Academic Affairs