St. XAVIER'S
CATHOLIC COLLEGE OF ENGINEERING
(Autonomous)
Chunkankadai, Nagercoil - 629003
Kanyakumari District, Tamil Nadu

Approved by AICTE & Affiliated to Anna University, Chennai
Accredited with 'A' Grade by NAAC
UG Programs(ECE, EEE, Mech, Civil, CSE & IT) Accredited by NBA
Recognized under section 2(f) & 12(B) of UGC Act, 1956
UG Programs(ECE, EEE, Mech, Civil, CSE & IT),
MBA & MCA Programs Permanently Affiliated

St. Xavier's Catholic College of Engineering, Chunkankadai, Nagercoil – 629003

(An Autonomous Institution)

Department of Electronics and Communication Engineering

Fourth Board of Studies Meeting

Date : 08/06/2024 **Venue : Einstein Seminar Hall**

MEMBERS PRESENT

Sl. No.	Name & Designation	Signature
1	Dr. J. Mahoswaran, PRINCIPAL	8/6/24
2	Dr. B. SATHYA BAMA, Professor, DEPT. OF ECE, TCE, MADURAI	B. Sathya Bama 8/6/24
3	Dr J. SHEEBA RANI, Professor IIRST, Trivandrum.	J Sheeba Rani.
4	Dr R Solomon Roach, Manager – Design Engineering, Tessolve Semiconductor Pvt. Ltd	
5	D. SAHAYA SHINY ASSOCIATE TECH LEAD, CAPESTART	
6	Dr. R. P. ANTO KUMAR Dean - Academics	08/06/2024
7	Dr. S. CAROLINE, HoD/ECE	8/6/24
8	S Mary Vasanthi, AP/ECE	
9	S. Maria Seraphin Sujitha	
10	A. C Jenisha	

11	Florin R, AP/ECE	
12	M. Starwin, AP/ECE	
13	K Baby Lisa, AP/ECE	
14	T. Mary Little Flower, AP/ECE	
15	R Benecka, AP/Placement Cell	
16	A S Hency Mol / Trainer / Placement Cell	
17	C. Sheeja Herobin Rani / Assoc. Prof ECE	
18	D Jeraldin Auxillia / Prof / ECE	
19	T Lalli / Prof / ECE	
20	A Anitha AP/ECE	
21	T. Ajitha AP/ECE	
22	C. Helen Sukanya, Prof / ECE	
23	Y.R. Annie Bunant AP/ECE	
24	C RENIT, AP/ECE	
25	V. Femila Savio / ECE	
26	L. Femila / AP/ECE	
27	B. C Preethi / AP/ECE	
28	S Absa/AP/ECE	
29	J. ARUN KING	
30	L. Marceal Tony	

St. Xavier's Catholic College of Engineering, Chunkankadai, Nagercoil – 629003

Department of Electronics and Communication Engineering

Board of Studies Meeting Minutes # 04

Date : 08/06/2024

Time : 10.00 am – 12.30 pm

Venue : Hybrid Mode (Einstein Seminar Hall)

The fourth BoS meeting of ECE, SXCCE was conducted on 08/06/2024 at 10.00 am at Einstein Seminar Hall.

University Nominee for BoS

1. Dr.B.Sathyabama, Professor, Department of Electronics and Communication, Thiagarajar College of Engineering, Madurai-625015

Expert Members in the Subject from outside the college

1. Dr.E.S.Gopi, Associate Professor, Department of ECE, NIT, Trichy **[ONLINE]**

2. Dr.J.Sheeba Rani, Associate Professor, Department of Avionics, Indian Institute of Space Science and technology (IIST), Trivandrum

Representative from Industry

1.Dr.R.Solomon Roach, Senior Design Lead Engineer, Tessolve Semiconductor Pvt. Ltd., Chennai

Postgraduate Meritorius Alumnus

1.Ms.A.Sahaya Shiny, Associate Tech Lead, CapeStart Software Pvt Ltd

Agenda and Notes

- Silent Prayer
- Welcome Address – Dr. S.Mary Vasanthi, Assistant Professor & AHoD/ ECE/SXCCE
- Introduction – Dr.J.Maheswaran, Principal /SXCCE

04.01. Confirmation of Third BoS meeting minutes held on **21/12/2023** and Decision/Action Taken report.

04.02. Discussion on the Suggestions / Recommendations offered by the members in the III Academic Council meeting and the III Governing Body meeting.

04.03. Getting recommendation for approval for the Semester VI Core and Open Elective I Courses detailed draft syllabi of UG Programme for Regulation 2022

04.04. Getting recommendation for approval of Additional courses

04.05. Grading Criteria for Industrial Training & Internship

04.06. Other matters if any.

- Vote of Thanks – Dr.T.Ajitha / Assistant Professor / ECE

04.01. Confirmation of Third BoS meeting minutes held on 21/12/2023 and Decision/Action Taken report

Suggestions given by BOS members	Action Taken
• EC22681 Robotics subject (Open Elective) should be renamed.	EC22681 subject is renamed as Robotic Process Automation.

OPEN ELECTIVES – I

SL. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	EC22681	Robotic Process Automation	OEC	3	0	0	3	3
2.	EC22682	Medical Instrumentation	OEC	3	0	0	3	3

• In VLSI design practical course, give the specific name as Implementation on FPGA instead of Xilinx /Altera. Implementation using Xilinx need not be specified.	Modified in the syllabus.
• For NPTEL credit transfer, students must get at least Elite credit in NPTEL exam.	Regarding NPTEL credit transfer suggestions given as per Anna University guidelines and common guidelines framed from college will be followed.

Mapping of Marks scored in NPTEL course and Credits earned

Letter Grade	Marks
O	90-100
A+	80-89
A	70-79
B+	60-69
B	50-59
C	40-49

• For DSP Processor, instead of TM3205xx series use TMC320C6X series and include Da Vinci Processor.	Syllabus is modified as per the suggestion given.

UNIT III	**TMS320C6X PROGRAMMABLE DSP PROCESSOR**	**9**
Architecture of TMS320C6x DSP Processor, Linear and Circular addressing modes, TMS320C6x Instruction Set, Assembler directives, Linear Assembly, Interrupts, Multichannel buffered serial ports, Block diagram of TMS320C67xx DSP Starter Kit and Support Tools		
UNIT IV	**IMPLEMENTATION OF BASIC DSP ALGORITHMS**	**9**
The Q – notation, FIR Filters, IIR Filters, Interpolation and Decimation Filters, An FFT Algorithm for DFT Computation, Overflow and Scaling, Bit – Reversed Index Generation & Implementation on the TMS32OC54xx. DaVinci Digital media processor.		

• As per the suggestion, Machine Learning subject in Vertical 2 can be offered as Open elective course for other department students.	Will offer this course as Open Elective for other department students.

OPEN ELECTIVES – II

SL. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	EC22781	Biometric Technology	OEC	3	0	0	3	3
2.	EC22782	Mobile App Development	OEC	3	0	0	3	3
3.	EC22726	Machine Learning Techniques	OEC	3	0	0	3	3

• Adaptive Method of Signal Processing topic can be included in Unit 2 of Wearable Devices.	Included in the syllabus.

UNIT II	SIGNAL PROCESSING AND ENERGY HARVESTING FOR WEARABLE DEVICES	9
Wearability issues -physical shape and placement of sensor, Technical challenges - sensor design, signal acquisition, sampling frequency for reduced energy consumption, Rejection of irrelevant information, Datamining. Power Requirements- Solar cell, Vibration based, Thermal based, Human body as a heat source for power generation, Hybrid thermoelectric photovoltaic energy harvests, Thermopiles		

• Rename the Vertical 4 title: Trends in Embedded and IoT (Since it is general make it to more specific).	Vertical renamed as IoT and its Applications

PROFESSIONAL ELECTIVE COURSES: VERTICALS

LIST OF IDENTIFIED VERTICALS	
Vertical 1	VLSI DESIGN AND TECHNOLOGY
Vertical 2	IMAGE AND SIGNAL PROCESSING
Vertical 3	HEALTHCARE DEVICES AND TECHNOLOGY
Vertical 4	IoT AND ITS APPLICATIONS
Vertical 5	WIRELESS AND SPACE TECHNOLOGIES

○ If possible, include Signal processing concepts in Wireless and Space Technologies vertical.	It is included.

UNIT IV	RADAR SIGNAL PROCESSING	9
Radar Signal Processing Fundamentals, Detection strategies, Optimal detection, Threshold detection, Constant False alarm rate detectors, Adaptive CFAR, pulse compression waveforms, compression gain, LFM waveforms matched filtering, radar ambiguity functions, radar resolution, Doppler spectrum of fluctuating targets, Range Doppler spectrum of stationary and moving radar.		

04.02. Discussion on the Suggestions / Recommendations offered by the members in the III Academic Council meeting and the III Governing Body meeting.

General suggestions were offered by the members and there were No Programme specific suggestions.

04.03. Getting recommendation for approval for the Semester VI Core and Open Elective I Courses detailed draft syllabi of UG Programme for Regulation 2022

SEMESTER VI

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY COURSES								
1.	HS22601	Professional Ethics	HSMC	3	0	0	3	3
2.		Open Elective – I	OEC	3	0	0	3	3
3.		Professional Elective III	PEC	3	0	0	3	3
4.		Professional Elective IV	PEC	3	0	0	3	3
THEORY COURSES WITH PRACTICAL COMPONENT								
5.	EC22601	Digital Communication	PCC	3	0	2	5	4
6.	EC22602	Embedded Systems and IoT Design	PCC	2	0	2	4	3
EMPLOYABILITY ENHANCEMENT COURSES								
7.	SD22602	Coding Skills and Quantitative Aptitude – Phase I	EEC	0	0	4	4	2
TOTAL				**17**	**0**	**8**	**25**	**21**

SEMESTER VII

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY COURSES								
1.	MS22701	Principles of Management	HSMC	3	0	0	3	3
2.		Professional Elective V	PEC	3	0	0	3	3
3.		Professional Elective VI	PEC	3	0	0	3	3
4.		Open Elective – II	OEC	3	0	0	3	3
5.		Open Elective – III	OEC	3	0	0	3	3
THEORY COURSES WITH PRACTICAL COMPONENT								
6.	EC22701	RF Communication	PCC	2	0	2	4	3
EMPLOYABILITY ENHANCEMENT COURSES								
7.	SD22702	Coding Skills and Quantitative Aptitude – Phase II	EEC	0	0	4	4	2
8.	EC22702	Product development Lab/ Mini project work	EEC	0	0	6	6	3
TOTAL				**17**	**0**	**12**	**29**	**23**

SEMESTER VIII

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
EMPLOYABILITY ENHANCEMENT COURSES								
1.	EC22801	Internship/ Project Work	EEC	0	0	16	16	8
TOTAL				**0**	**0**	**16**	**16**	**8**

TOTAL CREDITS: 167

SUMMARY

B.E. Electronics and Communication Engineering											
S.No	Subject Area	Credits per Semester								Total Credits	AICTE
		I	II	III	IV	V	VI	VII	VIII		
1	HSMC	5	3	1			3	3		15	15
2	BSC	12	10	4						26	25
3	ESC	5	13							18	24
4	PCC			17	20	9	7	3		56	48
5	PEC					6	6	6		18	18
6	OEC						3	6		9	18
7	EEC			2	2	4	2	5	8	23	15
8	MC	1	0	1		0				2	-
9	AC			x	x	x				x	0
Total		23	26	25	22	19	21	23	8	167	163

PROFESSIONAL ELECTIVE COURSES: VERTICALS

LIST OF IDENTIFIED VERTICALS	
Vertical 1	VLSI DESIGN AND TECHNOLOGY
Vertical 2	IMAGE AND SIGNAL PROCESSING
Vertical 3	HEALTHCARE DEVICES AND TECHNOLOGY
Vertical 4	IoT AND ITS APPLICATIONS
Vertical 5	WIRELESS AND SPACE TECHNOLOGIES

OPEN ELECTIVES

(List of Subjects offered by ECE to other department students)

OPEN ELECTIVES – I

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	EC22681	Robotic Process Automation	OEC	3	0	0	3	3
2.	EC22682	Medical Instrumentation	OEC	3	0	0	3	3

04.04. Getting recommendation for approval of Additional courses

ADDITIONAL COURSES

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	EC22717	VLSI Signal Processing	PEC	2	0	2	4	3
2.	EC22737	Environmental Radiation and Safety	PEC	3	0	0	3	3
3.	EC22747	AI and IoT based Intelligent Automation in Robotics	PEC	2	0	2	4	3

The BoS members recommended the three additional courses to be included in verticals.

DISCUSSION & ACTION TAKEN

Suggestions given by BOS members	Action Taken
EC22601 Digital Communication: Experiments	
• Lab experiments are to be rearranged unit wise	The experiments are rearranged as per the suggestions of the members
• Reduce the number of experiments - Merge the MATLAB simulation experiments	The number of experiments is reduced for this course.
List of Experiments 1. ASK, FSK and PSK - Modulation and Demodulation 2. Delta Modulation and Demodulation 3. Line coding schemes 4. Simulation of DPSK, QPSK and QAM generation schemes 5. Simulation of signal constellations of BPSK, QPSK and QAM 6. Simulation of Linear Block and Cyclic error control coding schemes 7. Communication link simulation	
• Breadboard connection is to be practised for modulation experiments instead of using kits	Course in charges will be instructed to make the students practice with breadboard connections
EC22602 Embedded Systems and IoT Design	
• Unit 2 does not contain operating system concept	Modified in the syllabus
UNIT II PROCESSES AND OPERATING SYSTEMS 6 Structure of a real time system - Task Assignment and Scheduling – Priority based scheduling – Interprocess Communication Mechanisms – Audio Player - Real time OS – Multi tasking OS	
• Instructor should know what are the modules from Unit 3 & 4 cover in the mini project • Do experiments using python	Will be instructed to the course in charge to follow these suggestions

• Students shall do the project parallelly with experiments - Initially we have to suggest the mini project title to the students. • Instructor should give the details of components available in the lab to the students	

Coding Skills and Quantitative Aptitude - Phase I

• Same title has to be followed in the seventh semester with Phase II	Modified in the curriculum

EMPLOYABILITY ENHANCEMENT COURSES								
7.	SD22702	Coding Skills and Quantitative Aptitude – Phase II	EEC	0	0	4	4	2

EC22747 AI and IoT based Intelligent Automation in Robotics

• Course contents should be rearranged as AI topic in the first unit followed with IoT.	Modified in the syllabus with AI as first unit

UNIT I	**INTRODUCTION TO ARTIFICIAL INTELLIGENCE**	**6**
Introduction to AI - AI Applications - Problem solving agents – search algorithms – uninformed search strategies – Heuristic search strategies – Local search and optimization problems – adversarial search – constraint satisfaction problems (CSP)		
UNIT II	**IOT DESIGN**	**6**

EC22682 Medical Instrumentation

• Syllabus may be reframed with basics. • Unit 4 title should be reframed to 'Measurement of biological parameters	Corrections are made as per suggestions from BoS members

EC22682	MEDICAL INSTRUMENTATION	L	T	P	C
		3	0	0	3
COURSE OBJECTIVES:					
• To illustrate origin of bio potentials and its propagation.					
• To understand the different types of electrodes and its placement for various recordings					
• To design bio amplifier for various physiological recordings					
• To learn the different measurement techniques for non-physiological parameters.					
• To summarize different biochemical measurements.					
UNIT I	**FUNDAMENTALS OF BIOMEDICAL ENGINEERING**				**9**
Sources of physiological signals, Transducer Types, Bio-potential Electrodes, Sensors, Signals-Types, Origin of bio potential and its propagation. Electrode-electrolyte interface, electrode–skin interface, half-cell potential, polarization effects of electrode – non polarizable electrodes. Types of electrodes - surface, needle and micro electrodes. Signal Processing and Methods of signal processing.					
UNIT II	**BIOPOTENTIAL MEASUREMENTS**				**9**
Bio signals characteristics – frequency and amplitude ranges. ECG – Einthoven's triangle, standard 12 lead system, Principles of vector cardiography. EEG – 10-20 electrode system, unipolar, bipolar and average mode. EMG– unipolar and bipolar mode. Recording of ERG, EOG and EGG.					
UNIT III	**BIO AMPLIFIERS**				**9**
Need for bio-amplifier - single ended bio-amplifier, differential bio-amplifier, Impedance matching circuit, isolation amplifiers – transformer and optical isolation - isolated DC amplifier and AC carrier amplifier., Power line interference, Right leg driven ECG amplifier, Band pass filtering.					
UNIT IV	**MEASUREMENT OF BIOLOGICAL PARAMETERS**				**9**
Temperature, respiration rate and pulse rate measurements. Blood Pressure: indirect methods -Auscultatory method, oscillometric method, direct methods: electronic manometer, Pressure amplifiers, Systolic, diastolic, mean detector circuit. Blood flow and cardiac output measurement: Indicator dilution, thermal dilution and dye dilution method					

EC22763 VLSI Signal Processing	
• Change unit 2 as Floating Point Operations	Unit 2 is changed as Floating Point Operations,
• Change unit 4 title as 'VLSI architecture for filter design' or 'Pipeline-based IIR' or 'Parallel architecture-based FIR/IIR'	Title of Unit 4 is changed as Pipeline/Parallel Architecture of Filters.
• Change Unit 5 as Algorithmic Transformations and reframe the syllabus	Unit 5 is changed as Algorithmic Transformations and syllabus is reframed.

EC22717	VLSI SIGNAL PROCESSING	L	T	P	C
		2	0	2	3

COURSEOBJECTIVES:

- To learn the fundamentals of floating point numbers.
- To study various floating point arithmetic and logical operations.
- To learn the Signal transformations.
- To design the filters for digital signal processing.
- To understand the mathematical calculations of CORDIC algorithm.

UNITI	**FLOATING POINT REPRESENTATIONS**	**6**
Floating point numbers – The ANSI/IEEE Floating point standard – Basic Floating point algorithms – Conversions and Exceptions –Logarithmic Number Systems.		
UNIT II	**FLOATING POINT OPERATIONS**	**6**
Floating point Adders/Subtractors – Pre and Post shifting – Rounding and Exceptions – Floating point multipliers – Logarithmic Arithmetic Unit.		
UNIT III	**SIGNAL TRANSFORMATIONS**	**6**
DSP Fundamentals – Sampling rate-Latency and pipelining – Fast Fourier Transform – Discrete Cosine Transform – Wavelet Transform.		
UNIT IV	**PIPELINE/PARALLEL ARCHITECTURE OF FILTERS**	**6**
Finite Impulse Response (FIR) Filter – Hardware architecture of w-tap FIR filter – Infinite Impulse Response (IIR) Filter – Hardware architecture of w-tap IIR filter.		
UNIT V	**ALGORITHMIC TRANSFORMATIONS**	**6**
The CORDIC Algorithm – Rotations and Pseudo rotations – Basic CORDIC Iterations – CORDIC Hardware – Generalized CORDIC – Using the CORDIC Method – An Algebraic Formulation.		

04.05. Grading Criteria for Industrial Training & Internship

- Internship rubrics will be followed commonly for all the departments

04.06. Other matters if any.

- Embedded system and IoT can be allotted as open elective - all the engineering graduates should learn – Included as an Open Elective course

OPEN ELECTIVES – I

SL. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	EC22681	Robotic Process Automation	OEC	3	0	0	3	3
2.	EC22682	Medical Instrumentation	OEC	3	0	0	3	3
3.	EC22602	Embedded Systems and IoT Design	OEC	2	0	2	4	3

24/6/24

HoD

Prof. Dr.R. P.ANTO KUMAR, M.E., Ph.D.
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