



Department of Electronics and Communication Engineering

Date: 30.03.2024


Minutes of Board of Studies Meeting

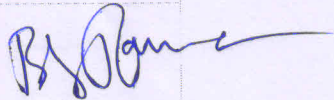

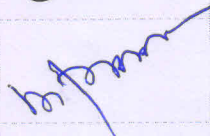
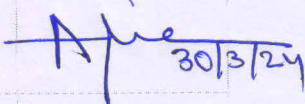
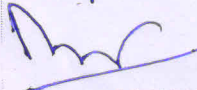
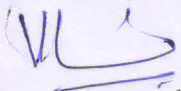
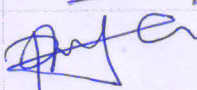
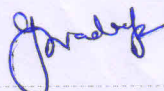
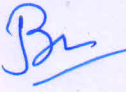
Board of Studies (BoS) meeting of B. Tech Electronics and Communication Engineering, B. Tech Electronic Engineering (VLSI Design and Technology), M. Tech Embedded Systems programs was conducted on 30.03.2024 in blended mode from 10.00am to 1.00pm. The venue for the meeting is VSF-08, CoE, H Block, VFSTR and the virtual meeting link is <https://us02web.zoom.us/j/6400485257?pwd=jN9EMqLRUorw6gcZ3T5gmA-QP1BvNQ>.

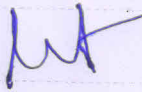
Agenda of the BoS Meeting:

1. To approve the R22 Minor Revision in curriculum and syllabus of B. Tech Electronics and Communication Engineering and B. Tech Electronics Engineering (VLSI Design and Technology) programs.
2. To Discuss and finalize the Minor changes in L-T-P structure and credits of department electives and Honors of B. Tech Electronics and Communication Engineering, B. Tech Electronics Engineering (VLSI Design and Technology).
3. To Discuss and finalize the curriculum structure and detailed syllabus of M. Tech – Embedded Systems- R22 regulations.
4. To ratify the list of MOOCS/NPTEL Courses.
5. Any other points with the permission of Chairperson.

The following members were present either thorough offline or online.

S.No.	Name and designation of the Member	Position	Signature
1.	Dr. T. Pitchaiah, Professor and Head, ECE Department, VFSTR Prof. Sreehari Rao Patri Professor	Chairperson	
2.	Department of Electronics & communication Engineering, National Institute of Technology, Warangal - 506004, Telangana, INDIA	External Member (Academic)	Attended in online

	Ph: 9441342324Mail: patri@nitw.ac.in		
3.	Dr. K. Krishna Naik, Associate Professor & HOD, Department of Electronics and Communication Engineering, Indian Institute of Information Technology, Design and Manufacturing, Kurnool. Ph: +91- 8275203259, Mail: krishnanaik@iiitk.ac.in	External Member (Academic)	Attended in online
4.	Dr. B. Seetha Ramanjaneyulu, Professor, ECE Department, VFSTR	Internal Member	
5.	Dr. N. Usha Rani, Professor & Dean-School of Electrical, Electronics and Communication Engg, VFSTR.	Internal Member	N. U. Rani 30/3/2024
6.	Dr. M. Sarada, Professor, ECE Department, VFSTR	Internal Member	
7.	Dr. M. Pachiyanan, Assoc. Professor, ECE Department, VFSTR	Internal Member	
8.	Dr. K. Annapurna, Assoc. Professor, ECE Department, VFSTR	Internal Member	 30/3/24
9.	Dr. P. J. Reginald, Asst. Professor, ECE Department, VFSTR	Internal Member	
10.	Dr. P. Vijayalakshmi, Asst. Professor, ECE Department, VFSTR	Internal Member	
11.	Dr. P. Sambaiah, Assoc. Professor, ECE Department, VFSTR	Nominee (Dean- R&D)	
12.	Dr. G. Pradeep, Asst. Professor, ECE Department, VFSTR	Nominee (Dean- SEECE)	
13.	Prof. Brahmjit Singh, Professor, Electronics & Communication Engg, National Institute of Technology, Kurukshetra, Harayana, INDIA. Ph: 01744-233271, 01744-233416, Mail: brahmjit@nitkkr.ac.in	Invitee	
14.	Dr. K Subbarangaiah, Director, Veda IIT, 2nd Floor, AYDIV IT Park, Sy. No.319 & 337 Partly, Puppalaguda Village, Hyderabad,	Invitee	Attended in online

	Rangareddy Dist., Telangana – 500032, INDIA		
15.	Mr. Bhavani Shankar, Executive Manager & Head – IoT, Efftronics Systems Pvt. Ltd. Plot No.4, IT Park, Auto Nagar, Mangalagiri Guntur District - 522503. Andhra Pradesh, INDIA. Ph: 9395155608 Mail:sbshankar@efftronics.com	Invitee	Attended in online
16.	Dr. G. S. R. Satyanarayana, Asst. Professor, ECE Department, VFSTR	Member Secretary	

The following members have taken leave of absence:

1. Dr. M. S. S. Rukmini, Professor, ECE Department, VFSTR.
2. Dr. Sk. Jakeer Hussain, Professor, ECE Department, VFSTR.
3. Dr. Y. Ravi Sekhar, Professor, ECE Department, VFSTR

Chairperson Dr. T. Pitchaiah, Professor and Head, department of Electronics and Communication engineering, VFSTR opened the meeting by welcoming and introducing the external members, invitees to the internal members. Chairperson presented about the *NEP 2020 Compliant Regulation - R22* which emphasis on creating *learning centric* (continuous learning and continuous assessment model), offering B.Tech., B.Tech. with Honours/ Research Honours/ Minor/ Add-on Diploma, *Dual degree* (B.Tech. + M.Tech./MBA, or M.Tech. + Ph.D.), providing multiple entry and multiple exits.

The following points were discussed in the BoS meeting:

1. R22 Minor Revision in curriculum and syllabus of B.Tech Electronics and Communication Engineering
 - Make the computer architecture and organization or Embedded Systems as mandatory courses instead of elective courses.
 - Members felt that Algorithms and data structures should be practiced using C.
 - Members felt that IT Tools in semester 1 - expecting to learn MS office suite also.
 - External members asked to reduce analog component and increase digital component
 - Rather than clubbing all electives majorly into one semester, distribute into more semesters. HoD mentioned that due to prerequisite criteria electives are pushed to third and final years.
 - For awarding the audit course credits for constitution of India, the student can be encouraged to enroll for vote. HoD expressed that the student may not attain the

required age eligibility when he pursue that course. The HoD mentioned that university is conducting special vote enrolment drives in the campus.

- Prof. Brahmjit Singh suggested to include Optical Fiber Communication and Cellular and Mobile Communication in professional core. HoD expressed that there is bandwidth issue with the professional core courses, he told that these can be offered in department electives as a mandatory one.
2. R22 Minor Revision in curriculum and syllabus of B. Tech Electronics Engineering (VLSI Design and Technology) with credits, credits distribution.
 - Dr. K Subbarangaiah suggested to change the title from “FPGA based System Design” to “FPGA based System Design with HDL” as this course contains Verilog HDL.
 - Dr. K Subbarangaiah suggested to include any HDL Synthesis course as an VLSI stream elective.
 - Dr. K Subbarangaiah suggested to include a new elective stream as Industry electives for B. Tech EE (VLSI Design and Technology) program.
 - Prof. Sreehari Rao Patri suggested to rename the analog circuits-1 and analog circuits-2 with suitable titles.
 - Dr. K Subbarangaiah and Prof. Sreehari Rao Patri suggested to segregate the department electives as analog and digital streams so that student can pursue his career in focused domain.
 3. Minor changes in L-T-P structure and credits of department electives and Honors of B. Tech Electronics and Communication Engineering and B. Tech Electronics Engineering (VLSI Design and Technology).
 4. Curriculum structure of M. Tech Embedded systems with credits, credits distribution.
 - Prof. Brahmjit Singh suggested to for suitable course title change for “Algorithms” since it is more generally used;
 5. List of MOOCS/NPTEL courses.


The following resolutions made after the discussion:

1. BoS Members approved the minor changes in curriculum structure, syllabus of B. Tech Electronics and Communication Engineering and B. Tech Electronics Engineering (VLSI Design and Technology) programme. This modified curriculum can be named it as R22-C24. The curriculum structure is provided in Appendix-I.
2. The presented department electives and honors are approved and they are provided in Appendix- II.
3. The M. Tech Embedded Systems course structure is approved and given in Appendix- III.
4. The presented NPTEL course list is ratified and provided in Appendix-IV.

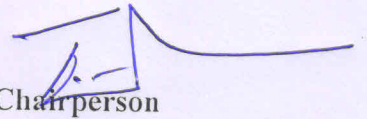
Based on the feedback from various stakeholders and suggestions given by the members, the Chairperson of BoS told that, those fruitful suggestions would be incorporated appropriately

in the modified curriculum structure and syllabi of the regulation R22 and this will be recommended to the Academic Council of VFSTR for the approval.

There being no further points for discussion, the Chairperson thanked all the external, internal, invited members and announced that the meeting was adjourned.



Member Secretary



Chairperson

Appendix-I

Curriculum structures

B. Tech Electronics and Communication Engineering:

I year I semester

Course Title	C	Course category
Mathematics – I / Mathematics – II	4	Basic Sciences
Physics / Chemistry	4	Basic Sciences
Basic of Electrical & Electronics Engineering/ Engineering Graphics	3	Basic Engineering
Programming in C	3	Basic Engineering
English Proficiency & Communication Skills (PET)	1	Humanities
IT Tools & Cyber security	2	Basic Engineering
Environmental Studies / Management Studies	3	Basic Sciences / Humanities
Total	20	

I year II semester

Course Title	C	Course category
Mathematics – II / Mathematics – I	4	Basic Sciences
Physics / Chemistry	4	Basic Sciences
Basic of Electrical & Electronics Engineering/Engineering Graphics	3	Basic Engineering
Competitive coding	3	Basic Engineering
Technical English Communication	3	Humanities
Environmental Studies / Management Studies	3	Basic Sciences / Humanities
Total	20	

II year I semester

Course Title	C	Course category
Maths – 3 (Dept. Specific)	4	Basic Sciences
Data Structures and Algorithms	4	Basic Engineering
SEMICONDUCTOR PHYSICS AND DEVICES	3	Basic Sciences
22EC102-NETWORK THEORY	4	Professional core
22EC205-Signals and Systems	4	Professional core
22EC203-Digital Electronics	4	Professional core
Design Thinking & Engineering Orientation	1	Basic Engineering
Total	24	

II year II semester

Course Title	C	Course category
Probability and Statistics	4	Basic Sciences
Practicing Data Structures	1	Basic Engineering
Field projects / IDP	1	Project
22EC209-Printed Circuit Board Design	1	Professional core
22EC203-Analog Circuits	4	Professional core
Analog communications	4	Professional core
22EC305-Electromagnetic waves and Transmission Lines	3	Professional core
Open Elective – 1 (NPTEL)	3	Open Elective
Total	21	

III year I semester

Course Title	C	Course category
Soft Skills Laboratory	1	Humanities
Digital communications	4	Professional core
22EC301-Microcontrollers	4	Professional core
22EC208-Control Systems	3	Professional core
Antenna Theory : Analysis and Design	4	Professional core
Open Elective – 2	3	Open Elective
Industry interface course (Modular course)	1	Department Elective
BEC Certification	1	Humanities
Total	21	

III year II semester

Course Title	C	Course category
Quantitative aptitude & Logical reasoning	2	Humanities
VLSI Design	3	Professional core
22EC308-Digital Signal Processing	4	Professional core
22EC401-Data Communications and Computer Networks	4	Professional core
Department Elective – 1	4	Department Elective
Open Elective – 3	3	Open Elective
Field projects / IDP	1	Project
Total	21	

IV year I semester

Course Title	C	Course category
Professional ethics	2	Humanities
Department Elective – 2	3	Department Elective
Department Elective – 3	4	Department Elective
Department elective – 4	4	Department Elective
Department Elective – 5	4	Department Elective
Department Elective – 6	4	Department Elective
Total	21	

IV year II semester

Course Title	C	Course category
Internship / Project Work	12	Project
Total	12	

B. Tech Electronics Engineering (VLSI Design and Technology):

I year I semester

Course Title	C	Course category
Mathematics – I / Mathematics – II	4	Basic Sciences
Physics / Chemistry	4	Basic Sciences
Basic of Electrical & Electronics Engineering/ Engineering Graphics	3	Basic Engineering
Programming in C	3	Basic Engineering
English Proficiency & Communication Skills (PET)	1	Humanities
IT Tools & Cyber security	2	Basic Engineering
Environmental Studies / Management Studies	3	Basic Sciences / Humanities
Total	20	

I year II semester

Course Title	C	Course category
Mathematics – II / Mathematics – I	4	Basic Sciences
Physics / Chemistry	4	Basic Sciences
Basic of Electrical & Electronics Engineering/Engineering Graphics	3	Basic Engineering
Competitive coding	3	Basic Engineering
Technical English Communication	3	Humanities
Environmental Studies / Management Studies	3	Basic Sciences / Humanities
Total	20	

II year I semester

Course Title	C	Course category
Maths – 3 (Dept. Specific)	4	Basic Sciences
Data Structures and Algorithms	4	Basic Engineering
SEMICONDUCTOR PHYSICS AND DEVICES	3	Basic Sciences
NETWORK THEORY	4	Professional core
Signals & Systems	4	Professional core
Digital Electronics	4	Professional core
Design Thinking & Engineering Orientation	1	Basic Engineering
Total	24	

II year II semester

Course Title	C	Course category
Probability and Statistics	4	Basic Sciences
Practicing Data Structures	1	Basic Engineering
Field projects / IDP	1	Project
Printed Circuit Board Design	1	Professional core
Analog Circuits-1	4	Professional core
EMTL	4	Professional core
FPGA Based System Design	3	Professional core
Open Elective – 1 (NPTEL)	3	Open Elective
Total	21	

III year I semester

Course Title	C	Course category
Soft Skills Laboratory	1	Humanities
Analog Circuits-2	4	Professional core
Microcontrollers	4	Professional core
Control Systems	3	Professional core
Communication Systems	4	Professional core
Open Elective – 2	3	Open Elective
Industry interface course (Modular course)	1	Department Elective
BEC Certification	1	Humanities
Total	21	

III year II semester

Course Title	C	Course category
Quantitative aptitude & Logical reasoning	2	Humanities
VLSI Design	3	Professional core
VLSI Testing & Validation	4	Professional core
SoC Design	4	Professional core
Department Elective – 1	4	Department Elective
Open Elective – 3	3	Open Elective
Field projects / IDP	1	Project
Total	21	

IV year I semester

Course Title	C	Course category
Professional ethics	2	Humanities
Department Elective – 2	3	Department Elective
Department Elective – 3	4	Department Elective
Department elective – 4	4	Department Elective
Department Elective – 5	4	Department Elective
Department Elective – 6	4	Department Elective
Total	21	

IV year II semester

Course Title	C	Course category
Internship / Project Work	12	Project
Total	12	

Appendix-II

Department electives and Honors for B. Tech ECE:

Stream- communication and signal processing

Name of the course (suggested semester to offer it)	No. of Credits
Optical Fiber Communication (DE-1/3-2)	3
Cellular and Mobile Communication (DE-2/4-1)	4
Satellite Communication (DE-3/4-1)	3
Advanced Digital Signal Processing (DE-4/4-1)	4
Multirate Digital Signal Processing (DE-5/4-1)	4
Fundamentals of Radar Signal Processing (DE-6/4-1)	4
SDR (Syllabus to be added from honors) (DE-6/4-1)	4

Stream – VLSI

Name of the course (suggested semester to offer it)	No. of Credits
FPGA based System Design (DE-1/3-2)	4
Verification using System Verilog (DE-2/4-1)	4
Testing of VLSI Circuits (DE-3/4-1)	3
System on Chip Design (DE-4/4-1)	3
SCRIPTING LANGUAGES (DE-5/4-1)	4
Hardware Verification Techniques (DE-6/4-1)	4
Python for Software/Hardware Co-design (DE-6/4-1)	4
C-based VLSI Design (DE-6/4-1)	4
ASIC Design(syllabus needed) (DE-6/4-1)	4

Stream – Embedded Systems and IoT

Name of the course (suggested semester to offer it)	No. of Credits
Computer Architecture and Organization (DE-1/3-2)	3
Introduction to Embedded Systems (IES) (DE-2/4-1)	4
Wireless Sensor Networks (DE-3/4-1)	3
Introduction to IoT (DE-4/4-1)	4
Introduction to Industry 4.0 and Industrial Internet of Things	4

Cognitive Radio Networks (CRN) (DE-6/4-1)	4
Smart & Virtual Instrumentation (DE-6/4-1)	3
REAL-TIME OPERATING SYSTEMS	4
IoT ARCHITECTURE	4
IoT DESIGN	4

Stream-Artificial Intelligence and Machine Learning (AI & ML)

Name of the course (suggested semester to offer it)	No. of Credits
Programming with Python (DE-1/3-2)	4
Statistical Analysis & Data Analytics (DE-2/4-1)	4
Digital Image Processing (DE-3/4-1)	4
Machine Learning and Data Science (DE-4/4-1)	4
Deep Learning and ANN (DE-5/4-1)	4
Time Series data analysis using Python (DE-6/4-1)	4
Human Machine Interaction (DE-6/4-1)	4

Stream – RF & MICROWAVE

Name of the course (suggested semester to offer it)	No. of Credits
RF Passive Circuits (DE-1/3-2)	3
RF Devices and Active Circuits (DE-2/4-1)	4
Microwave Engineering (DE-3/4-1)	4
Radar system design (DE-4/4-1)	4
Microwave Measurements (DE-6/4-1)	4
Smart Antennas (DE-6/4-1)	4
Advanced Antennas for Modern Wireless Communication	4
RFIC and Microwave MEMS(DE-6/4-1)	4

Honors for B. Tech ECE (Embedded Systems Stream):

subject	Credits
Unix/Linux shell scripting (2-2)	4
Introduction to Embedded Systems(3-1)	4
Introduction to IoT(3-2)	4
IoT security/ Sensors and Actuators for IoT (4-1)	4

Embedded RTOS (4-2)	4
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Department electives for B. Tech Electronics Engineering (VLSI Design and Technology):

Name of the course (suggested semester to offer it)	No. of Credits
Verification Using System Verilog (3-2)	4
Scripting languages (4-1)	4
Microchip Fabrication Technology (4-1)	3
CAO (4-1)	4
Physical Design and Automation (4-1) (to be taught by	4
CMOS RFIC Design (4-1)	4
Hardware Verification Techniques(4-1)(to be taught by	4
Mixed signal Design (4-1)	4
Hardware security (4-1)	3
DSP (4-1)	4

Honors for B. Tech Electronics Engineering (VLSI Design and Technology):

Name of the Honor course (suggested semester to offer it)	No. of Credits
DICA (2-2)	4
AICD (3-1)	4
DICD (3-2)	4
ASIC Design (4-1)	4
Nano Electronics Devices and device modelling (4-1)	4
Advanced digital system design (4-1)	4
Low power VLSI Design (4-1)	4
Sensors and sensor circuit design (4-1)	4
Hardware/Software Co-design using C/Python (4-1)	4

Appendix- III

M. Tech Embedded Systems Course Structure

I Year I Semester

S. No	Course Type	Course Title	L	T	P	C
1.	Professional Core -1	Advanced Micro controllers-I	2	2	2	4
2.	Professional Core -2	Real Time Operating Systems	2	2	2	4
3.	Professional Core -3	Algorithms	2	2	2	4
4.	Department Elective -1	Communication Technologies I	2	2	-	3
5.	Department Elective -2	IoT Architecture	2	-	2	3
6.	Cyber Security	Cyber Security	1	2	-	2
7.	EOP	EOP	-	2	2	2
8.	Audit Course-1		1	-	-	0
Grand Total			11	6	10	22
			33 Hrs			

I Year II Semester

S. No	Course Type	Course Title	L	T	P	C
1.	Professional Core - 4	Advanced Micro controllers II	2	2	2	4
2.	Professional Core -5	Kernel Programming and Device Drivers	2	2	2	4
3.	Department Elective -3	Communication Technologies II	2	2	-	3
4.	Department Elective -4	FPGA based System Design	2	-	2	3
5.	RM & IPR	RM & IPR	-	2	2	2
6.	Interdepartmental Project	Interdepartmental Project	-	1	3	2
7.	Teaching Activity	Teaching Activity	-	-	4	2
8.	Audit Course-2		1	-	-	0
Total						20
9.	Add-on degree 1		3	-	2	4
Grand Total			12	9	15	24
			35 Hrs			24

II Year I Semester

S. NO	Course Type	Course Title	L	T	P	C
1.	Project/ Internship		-	2	24	13
2.	Add on certification-2 (Moocs/ self-study)		4	-	-	4
Grand Total			4	2	24	17

II Year II Semester

S. NO	Course Type	Course Title	L	T	P	C
1.	Project/ Internship		-	2	24	13
2.	Add on certification-3 (Moocs/ self-study)		4	-	-	4
Grand Total			4	2	24	17

Department Electives:

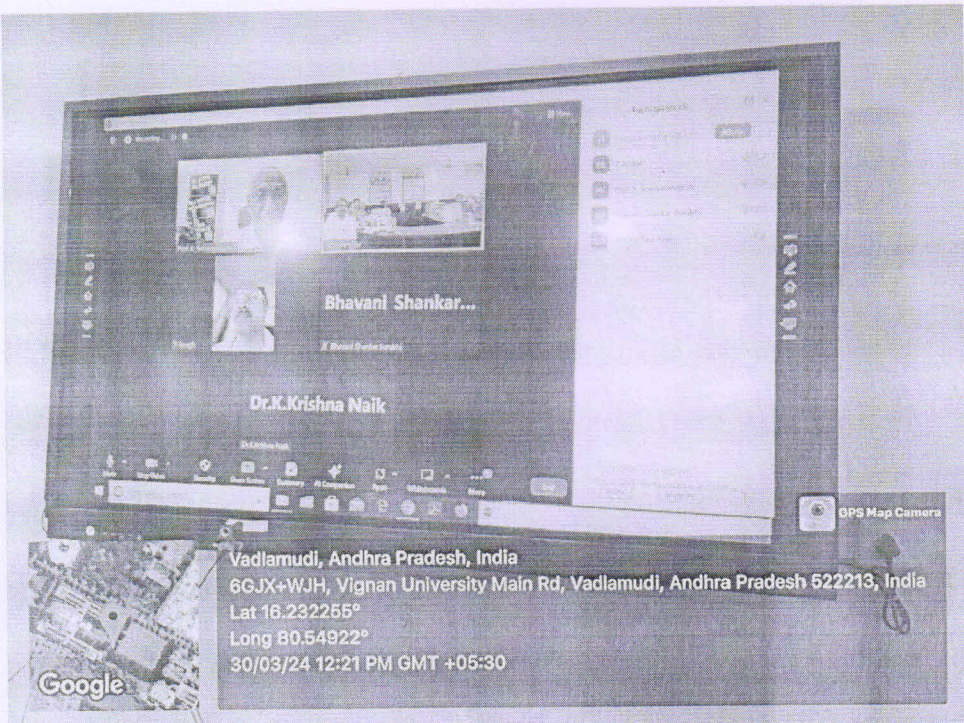
S. No	Course Title	L	T	P	C
1.	Communication Technologies I	2	2		3
2.	Communication Technologies II	2	2		3
3.	IoT Architecture	2		2	3
4.	FPGA based System Design	2		2	3
5.	Adhoc Sensor Networks	2	2		3

6.	Digital Image Processing	2	2		3
7.	Embedded System Security	2	-	2	3
8.	Sensors and Actuators	2	-	2	3

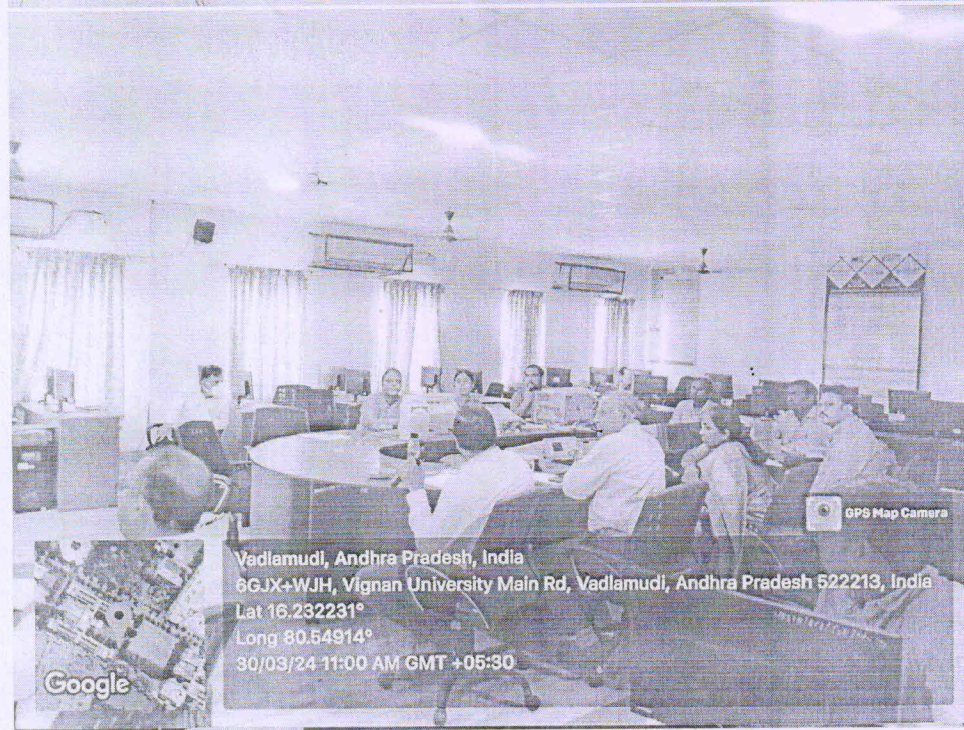
Appendix-IV

List of NPTEL Courses

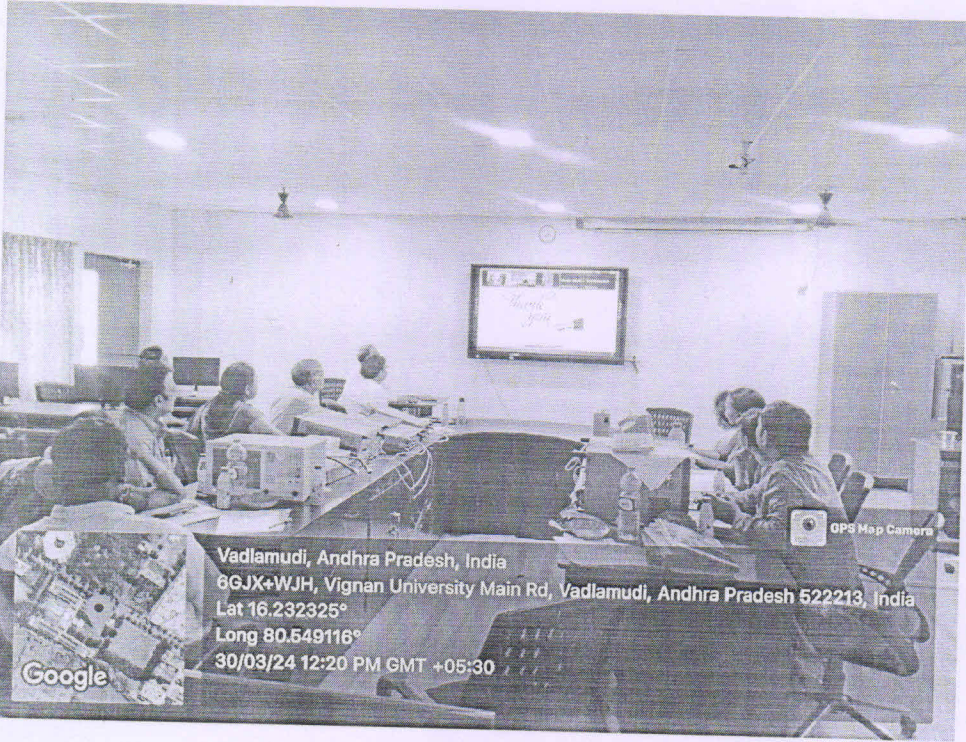
S. No	Course Code	Course Name	No of Weeks	No of Credits	Year
1	noc24_cs51	Introduction to Machine Learning	12	3	3,4
2	noc24_cs08	An Introduction to Artificial Intelligence	12	3	3,4
3	noc24_ee45	Sensors and Actuators	12	3	3,4
4	noc24_cs34	Introduction To Industry 4.0 And Industrial Internet of Things	12	3	3,4
5	noc24_ee59	Optical Wireless Communications for Beyond 5G Networks and IoT	12	3	3,4
6	noc24_ee72	Fundamentals Of MIMO Wireless Communication	8	2	3,4
7	noc24_ee44	Design and Analysis of VLSI Subsystems	12	3	3,4
8	noc24_ee29	CMOS Digital VLSI Design	8	2	3,4
9	noc24_cs17	Cloud Computing	12	3	3,4
10	noc24_cs43	Programming in Java	12	3	2,3,4
11	noc24_cs57	Joy of Computing Using Python	12	3	3,4
12	noc24_cs20	Data Analytics with Python	12	3	3



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