



VIGNAN'S
Foundation for Science, Technology & Research
UNIVERSITY

[Estd u/s 3 of UGC Act of 1956]

(DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING)

9th April, 2016

The following External members attended for the BoS meeting on 09/04/2016

1. Dr. N. V.S.N. Sharma, Professor, NIT Warangal. *N.V.S.N. Sharma*
2. Dr. S. Salivahanan, Principal, SSN College of Engg., Chennai. *S. Salivahanan*
3. Mr. S. Uma Mahesh, CEO, Indrion Technologies, Bangalore. *S. Uma Mahesh*
4. Mr. P. Haribabu, Scientist, CDAC, Bangalore *P. Haribabu*
5. Mr. G. Prudhviraaj, Firmware Engineer, Sandisk, Bangalore. *G. S. Prudhviraaj*

The Board of Studies Meeting for B.TECH (ECE) Program was held on 09-04-2016 in Board Room. The BOS Members Resolved and recommended the following:

- Sarma sir and Salivahanan sir appreciated the approach of syllabus design.
- Sarma sir: Give more credits to tutorials and labs. Decrease the credits of less important subjects.
- Sarma sir: Add engineering to Embedded Systems i.e embedded systems engineering. Better, tutorial should also have 2 hours as it is equivalent to lab.
- Sarma sir: The contents of Engineering Physics should be branch specific. For ECE branch include optics, electronics, quantum mechanics...etc. Otherwise better to classify into 2 groups.
 1. EP For Circuit branches
 2. EP For Non-Circuit branches
- Salivahanan sir: Environmental studies and chemistry should be in different semesters as faculty come from chemistry department for both.
- Sarma Sir: Engineering Products and solutions. Should be branch specific or classify into two groups.
 1. Circuit branches
 2. Non circuit branches

- Mr. Hari Babu and Dr.Sarma: General workshop should be plan for all.
- Sarma sir and Uma Mahesh: supported that idea stating that first citizens next engineers and then electronic engineers.

II Year

- Sarma Sir: Management accountancy should be given first preference.
MEFA is there
- Sarma Sir and Hari babu sir: Foreign language is not required.
- Sarma sir and Uma Mahesh: Foreign language can be offered in summer. These should not be a part of course.
- Salivahan Sir and Sarma Sir : First conduct some English tests those who are strong in English they can be given foreign language in the place of TEC.
- Sarma Sir : NT – Should be offered by EEE.
Before going to transmission line subject we need demo on kit i.e go for transmission lines demo kit.
- Uma Mahesh sir: NT is better if we deal with both lab and Theory.
- Sarma Sir : It Will be complicated if we deal with both.
- Uma Maheshsir and Sarma sir: S&S, NT, DE : 3+1+1
- Sarma Sir : In NT we should include synthesis as a small topic in the last unit.

III Year

- Poojitha: All the students are getting certified. So credits can't be reduced.
- Dr.N.Usha Rani, CRT can be replace by softskills.
- Uma Mahesh sir: Can softskills can be lab for previous English.
Explained regarding TEC, BEC, CRT
- Uma Mahesh sir: What about IELTS
- Rishi: It is equivalent to BEC score. IELTS scaling can be compared with BEC.
Teaching methodology of these explained by HoD Madam.
- Sarma Sir : Control systems in III-II is too late.
- Sarma Sir : No, It's better to push AC or EMWT to 3-1 and bring CS to 2nd year.
- Salivahan Sir: PDC wave shaping concept is missing.
- Sarma Sir : Labs – Simulation (4) + hands on (8)
- Prudhvi Raj sir: EDC & SS are required for LICA,
Sarma Sir : Reference Book – Ramakanth Gayakwad for LICA.
- Prudhvi Raj sir: 8085 is required in additional to 8086.

- Uma Mahesh sir: if is possible all processors need to explain and give assignment to the student for different processors.
- Sarma sir: How the processor works and need to point out how many number of hours required for particular topic for each subject.
- Uma Mahesh sir: What they learn dead of the course in VLSI. Is there is a any layout present in VLSI subjects.
Why HDL better to take verilog hardware description language.
- Sarma sir : Give chapter wise references in each subject then it is better to identified.

IV-I

- Sarma Sir: Microwave engineering → along with RF and ME.
EMI – we are not concentrating on measurements.
Data Communication and computer networks is very heavy.
Date communication should be a part of digital communication.
Computer network make separate subject.
- Ravi sekhar sir: Faculty should concentrate more on physical layers in Computer Network (CN).
- Sarma sir said ok.
Instead of soft skills better to include products specifications.

IV-II

- Sarma sir : The academic orientation i.e (mini project) of the project should be in 4-1 as like seminar or mini project.
- Nikhil : regarding internship after 2-2 and 3-2 summer 2 months + 2 members internship so during this period give project to all students.

IV-II

Entire semester for project

- Sarma sir : How do a comparison between the students doing a project here and internship (outside). There should be a commitment while during evaluation and save students are having less stipend and make the alternatives.
- Hari Babu sir: Better to include system design in curriculum.
- Uma Mahesh sir: In the curriculum VLSI having single subject through out entire B.Tech but industry people they need masters in VLSI. So with single subject students cannot become masters in that so better to provide modular courses.

PCB part is missing. It is required for getting job and why can't we build vignan smart computer.

- Hari babu sir: Like in IISC smart water is there.
- Srama sir: Instead of sending students to internship, give projects to faculty from industry then it is more efficient.
- Pitchaiah sir: regarding elective : fundamental subjects should be covered before offering electives.
So, better to offer electives from 3-1 onwards.
- BSR sir said ok
- Sarma sir : in II-II elective can be power electronics and power systems.
- Uma Mahesh sir: In what way MEMS are going to help the students, that is for which type industry jobs.
- Sarma sir: advanced digital communications should be changed to data communications
Split mobile & cellular communication into two subjects. Mobile Communications as elective & cellular communications as core
- Sarma sir: In RF and microwave last units should be radar.
- Sarma sir : Digital TV engineering, TV engineering, Radio and TV engineering should be must.

Automation instrumentation include data acquisition systems instead of digital control systems. But not non linear systems.

IoT should be open elective

DSP engineering electives : DSPA and Algorithms (instead of program)

- Prudvi Raj: Video processing should be followed by Image processing.
- Sarma Sir : Be specific in syllabus. Is it digital video processing.

The order should be

- Digital Image Processing – 1
- DSP and algorithms - 2
- Biomedical single – 3
- Video processing – 4
- Speech processing – 5

Embedded systems Electives

- IoT should be taken out for open elective
- include software and hardware core design.
- Operating systems is must.
- Prudvi Raj sir: Include RTOS in embedded linux.

- Sarma Sir : 1-2 DS (in the place of data subject systems)
 - Computer programming should go to 1-1.
 - Workshop must be conventional for all.
- Hari Babu sir: You are given more importance to soft skills.
- BSR sir: When we are offering CRT in last hours and holidays students are not taking it serious.
- Sarma sir: You send interesting faculty.
OS should be included in 2-1.
- Hari Babu sir : System Design engineering is missing.
You can go for ORCAD or Eagle to make them learn system design.
- Sarma Sir: In III year also conduct CRT related exam. If sufficient knowledge is acquired by some students then give electives instead of CRT to them.
Some people are not interested in getting job for them also we can offer electives instead of CRT.
- Prudvi Raj Sir: Microwave engineering can be move to elective and mobile engineering should be made as core in 4-1.
- Sarma Sir : Microwave engineering or radio frequency micro wave engineering? Of course it will be heavy .
- Sarma sir: Maintain uniformity in mentioning number of text books and references, Unit wise text book, no. Of hours required for each unit etc. Through out the syllabus book.
- **Sarma Sir:** Remove z transforms in 1st unit include matrices with multiple integrals.
Zener diode : load regulation characteristics, not simple zener characteristics.
PN junction diode: Cut in voltage, variation Q point observe on the load line.
- Sarma Sir: Concentrate on the finding midband gain, output impendence
H-parameter calculation, bandwidth.
NT: Include synthesis at end at least add ladder networks.
SS : LPF, HPF, BPF design should be there.
- Prudvi Raj sir: Include BRF also.
Include what is a different between time domain analysis and frequency domain analysis which is suitable for what.
- Sarma Sir: ECA : In class b pushpull amplifier is important. Add topics of current mirror and Darlington pair.
AC : In titles add detection also.
First Unit: Transmission lines

Next : Electromagnetic fields

- Uma Mahesh Sir : For EMFT better to incorporate lab.
- Hari babu Sir : Add regulators (78XXseries and 79XX)
For current / voltage boosting (LM317, 723).
- Salivahan Sir : Don't write IC 555, IC741.
- Hari Babu sir & Salivahan Sir: Add PLL experiment, Function generator experiments.
- Prudvi Raj Sir : SS Lab : Introduction to MAT Lab (floating and fixed)
- Prudvi Raj sir: S&S Lab: time domain to frequency domain conversion using graphical representation is required for operations like scaling, shifting use rand function to generate sine signal.

MP: No need to have 80186, 80286

Go through all the advanced processor by explaining gaps and applications. But not pins description and architecture.

Include power performance:

- Uma Mahesh Sir : Conduct modular course for all advanced processors.
Multi processing?
- Hari Babu sir: 8051 is only CISC controller
- Prudvi Raj sir : We can go for DSP multiple simulators.
- Uma Mahesh Sir: graphic processors
- Hari Babu Sir : GPU has many applications
- Prudvi Raj Sir: MPI Lab : Include square root of a perfect square number.
DC should include 4 point or 16 point QAM also.

Control Systems

- Salivahan Sir: Present the contents in Unit-II in proper manner.

VLSI Design

- Hari Babu sir: Unit – I Should include FPGA and ASIC design flow.

VHDL should be replaced by Verilog.

Course objectives need to be changed

DSP

- Prudvi Raj sir: Need to add DSP processor as some student may not apt for DSPA subject.
Club II & III units.
- Salivahana Sir: Filtering of long data sequences over lap save and overlap add methods can be removed.
- Prudvi Raj sir & Dr.M.S.S.R madam : Add DSP applications.

DSP Lab

- Prudvi Raj Sir : Include convolution property verification.
- Salivahan Sir: Expt. 9 is not included in theory so it need to be added in Unit-V.
- Prudvi Raj sir: Add noise addition and removal experiment.

Data Communications & Computer Networks

- Sarma sir: Computer networks should only be there otherwise it will be vast.
- Hari babu sir: In CN also the layers are data communications.
- Shalivahan Sir & Dr.A.S sir: Don't change the contents but title should be computer networks.

Lab : 1 to 4 experiments change them as study experiments instead of introduction.

- Uma Mahesh sir : Include creation of simple
- EMI
- Sarma sir: Subject name should be Electronic Instrumentation rather than electronics measurements and instrumentation.

Instrumentation Lab

- Uma Mahesh sir : Section-B components in lab will be hectic for B.Tech students so remove it.

Hardware Verification Techniques

- Uma Mahesh sir : Include verification for Timing analysis as most of the jobs in India depend on this.

Lab is required.

Need to include functional coverage and fault coverage.

The Outcomes of BoS meeting are as follows:

1. Major restructuring has taken place in the Curriculum with theoretical courses amalgamated with laboratory sessions and skill components added to the courses.
2. The curriculum follows the choice based credit system (CBCS).
3. The 4 years B.Tech programme is approved with effect from the academic year 2016-17. The proposed structure and syllabus is applicable for 2016 admitted batch onwards.
4. The finalised Course Structure is provided in (Appendix I)
5. The Curriculum is encompassing the courses that enable employability or entrepreneurship or skill development (Appendix II)
6. The courses in the revised curriculum (R16) significant changes are made in the content. The percentage of revision from R13 to R16 is 21%. The list of new courses provided in Appendix III.
7. Analysed Feedback from Stakeholders in CDMC is placed before the BoS and given utmost priority while designing the curriculum and their suggestions are implemented.


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APPENDIX - I

Course Structure

I Year – I Semester

Course Title	L	T	P	C
Engineering Mathematics-I	3	1	2	5
Engineering Physics	3	-	-	3
Technical English Communication	3	-	2	4
Basics of Computers and Internet	3	-	2	4
Computer Programming	3	1	2	5
Basics of Engineering Products	3	-	2	4
English Proficiency and Communication Skills			2	1
Engineering Physics Laboratory	-	-	3	2
Total	18	2	15	28

I Year – II Semester

Course Title	L	T	P	C
Engineering Mathematics-II	3	1	2	5
Engineering Chemistry	3	-	-	3
Engineering Graphics	1	-	3	3
Basics of Electrical and Electronics Engineering	3	-	2	4
Engineering Chemistry Laboratory	-	-	3	2
Environmental Science and Technology	2	-	-	2
Data Structures	3	-	2	4
Work shop Practice	-	-	3	2
Total	15	1	15	25

II Year I Semester

	Course Title	L	T	P	C
	Complex Variables and Transformations	3	1	-	4
	Materials for Electronics Engineering	3	-	-	3
	Electronic Devices and Circuits	3	-	2	4
	Network Theory	3	1	-	4
	Signals and Systems	3	-	2	4
	Digital Electronics	3	-	2	4
	Employability and Life Skills Elective*	-	-	-	1-3
	Total	18	2	6	24-26

* Courses and Programmes such as Foreign Languages, Summer Internship, NCC, NSS, Yoga, Music, Dance, Value Added Courses etc. for which credits and other details shall be defined by concerned coordinators.

II Year II Semester

	Course Title	L	T	P	C
	Probability Theory and Stochastic Processes	3	1	-	4
	Electronic Circuit Analysis	3	-	2	4
	Analog Communications	3	-	2	4
	Linear Control Systems	3	-	-	3
	Soft Skills Laboratory`	-	-	2	1
	Department Elective	-	-	-	3-4
	Department / Open Elective	-	-	-	3-4
	Employability and Life Skills Elective*	-	-	-	1-3
	Total	12	1	6	23-27

III Year I Semester

	Course Title	L	T	P	C
	Linear IC's and Applications	3	-	2	4
	Microprocessors and Microcontrollers	3	-	2	4
	Digital Communications	3	-	2	4
	Electromagnetic Waves and Transmission Lines	3	1	-	4
	Professional Communication Lab	-	-	2	1
	Department Elective	-	-	-	3-4
	Department / Open Elective	-	-	-	3-4
	Employability and Life Skills Elective*	-	-	-	1-3
	Total	12	1	8	24-28

III Year II Semester

	Course Title	L	T	P	C
	Professional Ethics	2	-	-	2
	Computer Architecture and Organization	3	-	-	3
	VLSI Design	3	-	2	4
	Antenna Propagation	3	1	-	4
	Digital Signal Processing	3	-	2	4
	Department Elective	-	-	-	3-4
	Department / Open Elective	-	-	-	3-4
	Employability and Life Skills Elective*	-	-	-	1-3
	Total	14	1	4	24-28

IV Year I Semester

	Course Title	L	T	P	C
	Management Science	3	-	-	3
	Optical Communications	3	-	-	3
	Microwave and Radar Engineering	3	-	2	4
	Electronic Instrumentation	3	-	2	4
	Computer Networks	3	-	2	4
	Department Elective	-	-	-	3-4
	Department / Open Elective	-	-	-	3-4
	Employability and Life Skills Elective*	-	-	-	1-3
	Total	15	-	6	25-29

IV Year II Semester

	Course Title	L	T	P	C
	Project work / Internship	-	-	30	15
	Total	-	-	30	15

DEPARTMENTELECTIVESTREAMSANDCOURSES

STREAM - 1: VLSI

	Course Title	L	T	P	C
	Digital System Design using HDL	3	-	2	4
	Perl and Python	3	-	-	3
	System on Chip Design	3	-	-	3
	Hardware Verification Techniques	3	-	-	3
	Testing of VLSI Circuits	3	-	-	3
	Nano Electronics	3	-	-	3

STREAM - 2: COMMUNICATION SYSTEMS

	Course Title	L	T	P	C
	Television Engineering	3	-	-	3
	Cellular and Mobile Communications	3	-	-	3
	Satellite Communications	3	-	-	3
	Digital Image Processing	3	-	2	4

STREAM - 3: EMBEDDED SYSTEMS AND NETWORKING

	Course Title	L	T	P	C
	Embedded Linux	3	1	-	4
	Microcontrollers for Embedded Systems	3	-	-	3
	Adhoc and Sensor Networks	3	-	-	3
	High Speed Networks	3	-	-	3


INDIVIDUAL ELECTIVE COURSES

	Course Title	L	T	P	C
	Operating Systems	3	-	2	4
	Unix and Shell Programming	3	-	-	3
	DSP Architectures and Programming	3	-	2	4
	Robotics and Automation	3	-	-	3
	Internet of Things	3	1	-	4
	MEMS and NEMS	3	-	-	3

MODULAR COURSES

	Course Title	L	T	P	C
	Thermal Management of Electronics Systems	2	-	-	2
	Introduction to Switch Mode Power Converters	2	-	-	2

Note: The courses that are highlighted denotes the implementation of “Choice Based Credit System (CBCS)”


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APPENDIX - II

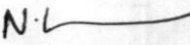
List of courses that enable employability or entrepreneurship or skill development in the R-16 B.Tech – Electronics & Communication Engineering

S. No	Year/ Semester	Course Name	Employability/Entrepreneurship/ Skill development
1	Semester I/ First Year	Engineering Mathematics	Skill Oriented
2	Semester I/ First Year	Engineering Physics	Skill Oriented
3	Semester I/ First Year	Technical English Communication	Employability
4	Semester I/ First Year	Basics of Computers and Internet	Skill Oriented
5	Semester I/ First Year	Computer Programming	Employability
6	Semester I/ First Year	Basics of Engineering Products	Skill Oriented
7	Semester I/ First Year	English Proficiency and Communication Skills	Employability
8	Semester I/ First Year	Engineering Physics Laboratory	Skill Oriented
9	Semester II/ First Year	Engineering Mathematics-II	Skill Oriented
10	Semester II/ First Year	Engineering Chemistry	Skill Oriented
11	Semester II/ First Year	Engineering Graphics	Skill Oriented
12	Semester II/ First Year	Basics of Electrical and Electronics Engineering	Skill Oriented
13	Semester II/ First Year	Engineering Chemistry Laboratory	Skill Oriented
14	Semester II/ First Year	Environmental Science and Technology	Skill Oriented
15	Semester II/ First Year	Data Structures	Employability
16	Semester II/ First Year	Work shop Practice	Employability
17	Semester I/ Second Year	Complex Variables and Transformations.	Skill Oriented

18	Semester I/ Second Year	MATERIALS FOR ELECTRONICS ENGINEERING	Skill Oriented
19	Semester I/ Second Year	ELECTRONIC DEVICES AND CIRCUITS	Skill oriented
20	Semester I/ Second Year	NETWORK THEORY	Skill Oriented
21	Semester I/ Second Year	SIGNALS AND SYSTEMS	Skill oriented
22	Semester I/ Second Year	DIGITAL ELECTRONICS	Skill Oriented
23	Semester II/ Second Year	PROBABILITY THEORY AND STOCHASTIC PROCESSES	Skill Oriented
24	Semester II/ Second Year	ELECTRONIC CIRCUIT ANALYSIS	Skill Oriented
25	Semester II/ Second Year	ANALOG COMMUNICATIONS	Skill Oriented
26	Semester II/ Second Year	LINEAR CONTROL SYSTEMS	Skill Oriented
27	Semester II/ Second Year	Soft Skills Laboraotry	Employability
28	Semester II/ Second Year	Employability and Life Skills	Skill Oriented
29	Semester II/ Second Year	Digital System Design using HDL	Employability
30	Semester II/ Second Year	Television Engineering	Skill Oriented
31	Semester II/ Second Year	Embedded Linux	Skill Oriented
32	Semester II/ Second Year	Unix and Shell Programming	Skill Oriented
33	Semester II/ Second Year	Perl and Python	Employability
34	Semester I/ Third Year	Linear IC's and Applications	Skill Oriented
35	Semester I/ Third Year	Microprocessors and Microcontrollers	Employability
36	Semester I/ Third Year	Digital Communications	Skill Oriented
37	Semester I/ Third Year	Electromagnetic Waves and Transmission Lines	Skill Oriented
38	Semester I/ Third Year	Professional Communications Laboratory	Employability
39	Semester I/ Third Year	Employability and Life Skills	Skill Oriented

40	Semester I/ Third Year	Professional Ethics	Entrepreneurship
41	Semester II/ Third Year	Computer Architecture and Organization	Skill Oriented
42	Semester II/ Third Year	VLSI Design	Skill Oriented
43	Semester II/ Third Year	Antenna Propagation	Skill Oriented
44	Semester II/ Third Year	Digital Signal Processing	Skill Oriented
45	Semester II/ Third Year	Modular Course	Employability
46	Semester II/ Third Year	System on Chip Design	Skill Oriented
47	Semester II/ Third Year	Cellular and Mobile Communications	Skill Oriented
48	Semester II/ Third Year	Operating Systems	Skill Oriented
49	Semester II/ Third Year	Embedded and RTOS	Skill Oriented
50	Semester II/ Third Year	Microcontrollers for Embedded Systems	Employability
51	Semester II/ Third Year	Management Science	Entrepreneurship
52	Semester II/ Third Year	Optical Communications	Skill Oriented
53	Semester I/ Fourth Year	Microwave and Radar Engineering	Skill Oriented
54	Semester I/ Fourth Year	Electronic Instrumentation	Skill Oriented
55	Semester I/ Fourth Year	Computer Networks	Skill Oriented
56	Semester I/ Fourth Year	Hardware Verification Techniques	Employability
57	Semester I/ Fourth Year	Testing of VLSI Circuits	Employability
58	Semester I/ Fourth Year	Nano Electronics	Skill Oriented
59	Semester I/ Fourth Year	Satellite Communications	Skill Oriented
60	Semester I/ Fourth Year	Digital Image Processing	Skill Oriented
61	Semester I/ Fourth Year	Adhoc and Sensor Networks	Skill Oriented
62	Semester I/ Fourth Year	High Speed Networks	Skill Oriented

63	Semester I/ Fourth Year	DSP Architectures and Programming	Skill Oriented
64	Semester I/ Fourth Year	Robotics and Automation	Skill Oriented
65	Semester I/ Fourth Year	Internet of Things	Employability
66	Semester I/ Fourth Year	MEMS and NEMS	Skill Oriented
67	Semester II/ Fourth Year	Project Work/ Internship	Employability


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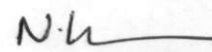
APPENDIX - III

List of New courses in the R-16

B.Tech – Electronics & Communication Engineering Curriculum

S. No	Year/ Semester	Course Name
1	Semester I/ Second Year	MATERIALS FOR ELECTRONICS ENGINEERING
2	Semester I/ Second Year	ELECTRONIC DEVICES AND CIRCUITS
3	Semester I/ Second Year	NETWORK THEORY
4	Semester I/ Second Year	SIGNALS AND SYSTEMS
5	Semester I/ Second Year	DIGITAL ELECTRONICS
6	Semester II/ Second Year	PROBABILITY THEORY AND STOCHASTIC PROCESSES
7	Semester II/ Second Year	ELECTRONIC CIRCUIT ANALYSIS
8	Semester II/ Second Year	ANALOG COMMUNICATIONS
9	Semester II/ Second Year	LINEAR CONTROL SYSTEMS
10	Semester II/ Second Year	Soft Skills Laboratory
11	Semester II/ Second Year	Employability and Life Skills
12	Semester II/ Second Year	Digital System Design using HDL
13	Semester II/ Second Year	Television Engineering
14	Semester II/ Second Year	Embedded Linux
15	Semester II/ Second Year	Unix and Shell Programming
16	Semester II/ Second Year	Perl and Python
17	Semester I/ Third Year	Linear IC's and Applications
18	Semester I/ Third Year	Microprocessors and Microcontrollers
19	Semester I/ Third Year	Digital Communications
20	Semester I/ Third Year	Electromagnetic Waves and Transmission Lines
21	Semester I/ Third Year	Professional Communications Laboratory
22	Semester I/ Third Year	Employability and Life Skills
23	Semester I/ Third Year	Professional Ethics
24	Semester II/ Third Year	Computer Architecture and Organization
25	Semester II/ Third Year	VLSI Design
26	Semester II/ Third Year	Antenna Propagation
27	Semester II/ Third Year	Digital Signal Processing
28	Semester II/ Third Year	Modular Course
29	Semester II/ Third Year	System on Chip Design
30	Semester II/ Third Year	Cellular and Mobile Communications

31	Semester II/ Third Year	Operating Systems
32	Semester II/ Third Year	Embedded and RTOS
33	Semester II/ Third Year	Microcontrollers for Embedded Systems
34	Semester II/ Third Year	Management Science
35	Semester II/ Third Year	Optical Communications
36	Semester I/ Fourth Year	Microwave and Radar Engineering
37	Semester I/ Fourth Year	Electronic Instrumentation
38	Semester I/ Fourth Year	Computer Networks
39	Semester I/ Fourth Year	Hardware Verification Techniques
40	Semester I/ Fourth Year	Testing of VLSI Circuits
41	Semester I/ Fourth Year	Nano Electronics
42	Semester I/ Fourth Year	Satellite Communications
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44	Semester I/ Fourth Year	Adhoc and Sensor Networks
45	Semester I/ Fourth Year	High Speed Networks
46	Semester I/ Fourth Year	DSP Architectures and Programming
47	Semester I/ Fourth Year	Robotics and Automation
48	Semester I/ Fourth Year	Internet of Things
49	Semester I/ Fourth Year	MEMS and NEMS
50	Semester II/ Fourth Year	Project Work/ Internship


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