NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech. – Electrical and Electronics Engineering		
Course Title	Electron Devices		
Course Code	EEPC10	No. of Credits	03
Course Code of Pre-requisite subject(s)	Basic Physics		
Session	January 2019	Section (if, applicable)	A&B
Name of Faculty	Dr. M Sahoo	Department	EEE
Official Email	sahoo@nitt.edu	Telephone No.	
Name of Course Coordinator(s) (if, applicable)	NA		
Official E-mail	NA	Telephone No.	NA
Course Type (please tick appropriately)	☑ Core course	☐ Elective course	

Syllabus (approved in BoS)

- Semi-conductors – charge carriers, electrons and holes in intrinsic and extrinsic semi-conductors –Hall effect.
- Diodes – PN junction – current equation – Junction Capacitance – breakdown characteristics of Zener diode, Tunnel diode, Schottky diode.
- Bipolar junction transistors – Characteristics – Analysis of CB, CE, CC amplifier configurations.
- Unipolar devices – FET, MOSFET, UJT and Opto-Electronic devices – theory and characteristics.
- Rectifiers and switched mode power supplies – theory and design, filter circuits, applications.

COURSE OBJECTIVES

To educate on the construction and working of common electronic devices and to prepare for application areas.

MAPPING OF COs with POs

Course Outcomes: Upon completion of the course, the student will be able to	Programme Outcomes (PO)
1. Understand the semiconductor physics of the intrinsic, p and n materials and various devices and characteristics.	2,3,8,9

2. Analyze simple diode circuits under DC and AC excitation.	**1,2,8,9**
3. Analyze and design simple amplifier circuits using BJT in CE, CC and CB configurations.	**1,2,8,9**
4. Understand the analysis and salient features of CE, CC & CB amplifier circuits.	**1,2,3,8,9**
5. Understand the construction and characteristics of FET, MOSFET and UJT.	**1,2,3,8,9**

COURSE PLAN – PART II

COURSE OVERVIEW

The basic understanding of electronics devices is established by studying the semiconductor material like p-type and n-type material. After knowing the material, PN junction semiconductor devices will be discussed which is necessary to understand the construction of devices like diode, BJT, FET. Operation of these devices along with ots input and output charecteristics will be discussed. After understanding the devices, some of its applications like rectifiers, switched mode power supplies, filter curcuit etc. will be discussed.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	2nd week of January '19 (7-11) 3 hrs	Introduction to the course, semiconductor	Lecture/Tutorial Chalk &Talk
2	3rd week of January '19 (17-18) 2 hrs	Charge carrier, intrinsic and extrinsic semiconductor	
3	4th week of January '19 (21-25) 3 hrs	Transportation of carrier: Drift and diffusion, Hall effect, PN Junction	
4	5th week of January '19 (28-1st Feb) 3 hrs	Current equation diode, characteristics, small signal model of diode, junction capacitance	
5	2nd week of February '19 (04-08) 3 hrs	Zener diode: break down characteristics, tunnel diode, Schottky diode	
6	3rd week of February '19 (11-15) 3 hrs	Application of diode	Lecture/Tutorial Chalk &Talk

7	4th week of February '19 (18-22) 3 hrs	Introduction to BJT, types of BJT. its operation and characteristics	Lecture/Tutorial Chalk &Talk
8	5th week of February '19 (25-1st March)	BJT: Analysis of CB, CE, CC amplifier configuration	
9	1st week of March '19 (04-08) 3 hrs	BJT: Analysis of CB, CE, CC amplifier configuration	
10	2nd week of March '19 (11-15) 3 hrs	Introduction to FET, MOSFET, construction	
11	3rd week of March '19 (18-22) 3 hrs	Operation of MOSFET and its characteristics	
12	4th week of March '19 (25-29) 3 hrs	Operation of MOSFET and its characteristics	
13	1st week of April '19 (01-05) 3 hrs	Switched mode power supplies, theory and design	
14	2nd week of April '19 (08-12) 3 hrs	Filter circuits	

Course Assesment Methods

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment-1 (CT-1) (Written Test)	4th week of February '19 25/02/2019	1 hr	20
2	Assessment-2 (CT-2) (Written Test)	3rd week of April '19, 18/04/2019	1 hr	20
3	Assessment-3 (2 Nos. Each for 10 marks- Surprize/Quiz Tests)	During regular Classes	1 hr	20
4 (CPA)	Compensation Assessment* (Written Test)	4th week of April '19	1 hr	20
5	Assessment-4 (End sem) (Written Test)	1st week of May '19	2 hr	40

***mandatory; refer to guidelines on page 4**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

- Feedback from students during class committee meetings
- Feedback through questionnaire

COURSE POLICY (including compensation assessment to be specified)

- The above course has 5 assessments in total (A1, A2, A3 (2), A4, CPA)
- There will be no compensation assessment for Assessment-3
- The compensation assessment will include the portion in A1 and A2

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

- The faculty is available for consultation at times as per the information given by the faculty.
- Queries and feedback may also be emailed to the faculty directly: email: **sahoo@nitt.edu**

FOR APPROVAL

Course Faculty _____ **CC- Chairperson** _____ **HOD** _____