



# NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

## DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE PLAN – PART I			
<b>Name of the programme and specialization</b>	<b>B.Tech. – Electrical and Electronics Engineering</b>		
<b>Course Title</b>	<b>Electron Devices</b>		
<b>Course Code</b>	<b>EEPC13</b>	<b>No. of Credits</b>	<b>03</b>
<b>Course Code of Pre-requisite subject(s)</b>	<b>Basic Physics</b>		
<b>Session</b>	<b>JULY 2020</b>	<b>Section (if, applicable)</b>	<b>A</b>
<b>Name of Faculty</b>	<b>Dr. M Sahoo</b>	<b>Department</b>	<b>EEE</b>
<b>Official Email</b>	<b>sahoo@nitt.edu</b>	<b>Telephone No.</b>	
<b>Name of Course Coordinator(s) (if, applicable)</b>	<b>NA</b>		
<b>Official E-mail</b>	<b>NA</b>	<b>Telephone No.</b>	<b>NA</b>
<b>Course Type (please tick appropriately)</b>	<input checked="" type="checkbox"/> <b>Core course</b>	<input type="checkbox"/> <b>Elective course</b>	
<b>Syllabus (approved in BoS)</b>			
<ul style="list-style-type: none"> <li>• Semi-conductors – charge carriers, electrons and holes in intrinsic and extrinsic semi-conductors –Hall effect.</li> <li>• Diodes – PN junction – current equation – Junction Capacitance – breakdown characteristics of Zener diode, Tunnel diode, Schottky diode.</li> <li>• Bipolar junction transistors – Characteristics – Analysis of CB, CE, CC amplifier configurations.</li> <li>• Unipolar devices – FET, MOSFET, UJT and Opto-Electronic devices – theory and characteristics.</li> <li>• Rectifiers and switched mode power supplies – theory and design, filter circuits, applications.</li> </ul>			
<b>COURSE OBJECTIVES</b>			
To educate on the construction and working of common electronic devices and to prepare for application areas.			
<b>MAPPING OF COs with POs</b>			
<b>Course Outcomes:</b> Upon completion of the course, the student will be able to	<b>Programme Outcomes (PO)</b>		
1. Understand the semiconductor physics of the intrinsic, p and n materials and various devices and characteristics.	<b>2,3,8,9</b>		



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 its input and output characteristics will be discussed. After understanding the devices, some of its applications like rectifiers, switched mode power supplies, filter circuit etc. will be discussed.

**COURSE TEACHING AND LEARNING ACTIVITIES**

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1 <sup>st</sup> week to 3 <sup>rd</sup> week	Introduction to the course, semiconductor Charge carrier, intrinsic and extrinsic semiconductor Transportation of carrier: Drift and diffusion, Hall effect	Online lecture
2	3 <sup>rd</sup> week to 5 <sup>th</sup> week	PN Junction, Current equation diode, characteristics, small signal model of diode, junction capacitance Zener diode: break down characteristics, tunnel diode, Schottky diode Application of diode	



3	6 <sup>th</sup> week to 8 <sup>th</sup> week	Introduction to BJT, types of BJT. its operation and characteristics BJT: Analysis of CB, CE, CC amplifier configuration	Online Lecture
4	8 <sup>th</sup> week 10 <sup>th</sup> week	Introduction to FET, MOSFET, construction Operation of MOSFET and its characteristics Operation of MOSFET and its characteristics	
5	11 <sup>th</sup> week to 12 <sup>th</sup> week	Switched mode power supplies, theory and design Filter circuits	

**Course Assesment Methods**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment-1 (CT-1) (Written Test)	8 <sup>th</sup> Week	1-2 Hr	20
2	Assessment-2 (CT-2) (Written Test)	11 <sup>th</sup> Week	1 – 2 Hr	20
3	Assessment-3 Surprize Quiz Test (15%) Assignment (10%) Class Notes Preparation (5 %)	Through Out the Semester	-	30
4 (CPA)	Compensation Assessment* (Written Test)	14 <sup>th</sup> Week	1 – 2 Hr	20
5	Assessment-4 (End sem) (Written Test)	15 <sup>th</sup> Week	2 – 3 Hr	30

**\*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 (3), 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  \_\_\_\_\_



**Guidelines**

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- d) The passing minimum shall be as per the regulations.

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2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.