



NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech Mechanical Engineering		
Course Title	APPLIED ELECTRICAL AND ELECTRONICS ENGINEERING		
Course Code	MEPC13	No. of Credits	04
Course Code of Pre-requisite subject(s)	EEIR11		
Session	January 2019	Section (if, applicable)	A / B
Name of Faculty	Dr.Geetha N	Department	ELECTRICAL AND ELECTRONICS ENGINEERING
Official Email	geethan@nitt.edu	Telephone No.	
Name of Course Coordinator(s) (if, applicable)	--		
Official E-mail		Telephone No.	
Course Type (please tick appropriately)	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
Syllabus (approved in BoS)			
<p>Asynchronous Machines: Three phase induction motors – Principle of operation – Cage and Slip ring rotors. Torque – Slip Characteristics - Equivalent Circuit – Starting and Speed Control.</p> <p>Single Phase induction motors – Types – Applications – Universal Motor.</p> <p>Selection of Drives: Electric drives – Individual and Group drives – Factors governing selection of drives – Motors for domestic uses. Cranes, Lifts, General Factory, Textile Mill, Paper Mill, Mining Work, Cement Mill, Machine Tools, Belt Conveyors, Ships, Refrigeration and Air Conditioning.</p> <p>Amplifier circuits – R.C. Coupled, Transformer Coupled, Direct Coupled; Differential amplifiers. Concept of negative feed-back; Feed-back amplifiers. Applications of operational amplifiers. Inverting and non-inverting amplifiers; Differentiator – Multiplier - Divider, Comparator - VI and IV converter.</p> <p>Digital Circuits – D/A and A/D – Types; Sample and Hold circuit - Multiplexers, Demultiplexers, Decoder and Encoders. Practice on R.C. Coupled amplifier, OP amp, Multiplexers and Demultiplexers, SCR and Applications, Power supply and Regulator</p>			
COURSE OBJECTIVES			
<p>1. To understand the basics concepts of electric & magnetic circuits. 2. To learn the principle of operations of electrical machines. 3. To impart knowledge on different type of drives for various applications in industries. 4. To impart knowledge on different kinds of amplifiers. 5. To understand the</p>			



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concepts of Digital Circuits, Coupled amplifier, Multiplexers and Demultiplexers.	
MAPPING OF COs with POs	
Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. Differentiate the synchronous motors from the three phase induction motor and their control	1,2,3,4,5
2. Identify various applications of three phase and single phase induction machines.	1,2,3,4,5
3. Recognize and select the different type of drives for various applications in industries.	1,2,3,4,5
4. Demonstrate different kind of amplifiers, operational amplifiers and feedback circuits.	1,2,3,4,5
5. Recognize the different types of converters and their contributions in various circuits.	1,2,3,4,5
6. Construct and analysis of multiplexers, demultiplexers, decoders and encoders	1,2,3,4,5

COURSE PLAN – PART II

COURSE OVERVIEW

This course is designed to expose students about the principle of operation of three phase and single phase induction motors, torque slip characteristics and their applications. Various type of drives for numerous applications in industries have also been dealt in this course. Different kinds of amplifiers, operational amplifiers, feedback circuits multiplexers, demultiplexers, decoders and encoders are also analyzed.

COURSE TEACHING AND LEARNING ACTIVITIES

(Add more rows)

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1 st and 2 nd Week of January (6 contact hours)	Three phase induction motors – Principle of operation – Cage and Slip ring rotors. Torque – Slip Characteristics	Chalk & Talk
2	3 rd Week of January (4 contact hours)	Equivalent Circuit – Starting and Speed Control	Chalk & Talk
3	4 th Week & 5 th Week of January (7 contact hours)	Single Phase induction motors – Types – Applications- Universal Motor	Chalk & Talk
		Assessment 1	
4	1 st Week of February (5 contact hours)	Electric drives – Individual and Group drives – Factors governing selection of drives – Motors for domestic uses.	Chalk & Talk



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5	2 nd Week of February (4 contact hours)	Cranes, Lifts, General Factory, Textile Mill, Paper Mill, Mining Work, Cement Mill, Machine Tools, Belt Conveyors, Ships, Refrigeration and Air Conditioning	Chalk & Talk
		Assessment II for Single Phase induction motors ,Types and drives applications	
6	3 rd Week of February (4 contact hours)	R.C. Coupled, Transformer Coupled, Direct Coupled; Differential amplifiers	Chalk & Talk
7	4 th Week of February (4 contact hours)	Concept of negative feed-back; Feed-back amplifiers. Applications of operational amplifiers.	Chalk & Talk
8	1 st Week of March (4 contact hours)	Differentiator – Multiplier - Divider, Comparator - VI and IV converter	Chalk & Talk
9	2 nd Week of March (4 contact hours)	Assessment III for Amplifier circuits	Chalk & Talk
		Digital Circuits – D/A and A/D – Types; Sample and Hold circuit	
10	3 rd Week of March (3 contact hours)	Multiplexers, Demultiplexers, Decoder and Encoders.	Chalk & Talk
11	4 th Week of March (4 contact hours)	Assessment IV for Digital circuits Practice on R.C. Coupled amplifier, OP amp, SCR and Applications, Power supply and Regulator	
12	1 st Week of April(4 contact hours)	Practice on Multiplexers and Demultiplexers.	
13	2 nd Week of April (4 contact hours)	Compensation assessment	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	1 st Mid Semester Examination (Written test) (1 st Unit)	06/02/2019	60 Minutes	10
2	2 nd Mid Semester Examination (Written test) (2 nd and 3 rd Unit)	27/02/2019	60 Minutes	15
3	Take Home / Team Task	3 rd to 13 th week of	Work will be	15



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		course	carried out along with the course	
4	3 rd Mid Semester Examination (Written test) (4 th Unit)	27/03/2019	60 Minutes	10
CPA	Compensation Assessment*	1 st Week of April	60 Minutes	15
5	4 th Mid Semester Examination (Written test) (5 th Unit)	10/04/2019	60 Minutes	10
6	Final Assessment *	Last Week of April/1 st Week of May	180 Minutes	40

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

Reference Books:

1. Theraja, B.L., Electrical Technology, Vol – 2, S. Chand & Company, 1997.
2. Gupta, J.B., A Course in Electrical Power, S.K. Kataria & Sons, 1997.
3. Hughes, E., Electrical Technology, E.L.B.S. 1996.
4. Partab, H., Art & Science of utilization of Electrical Energy, Dhanpat Rai & Sons, 1997.
5. Sedra, A.S. and Smith, K.C., Micro Electronic Circuits, Oxford University Press, 2004.
6. Millman and Halkias, Integrated Electronics, Tata McGraw -Hill, 1998.
7. Donald A. Neamen, Electronic Circuit Analysis and Design, Tata McGraw- Hill, 2002.

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

Shall be obtained at the end.

COURSE POLICY (including compensation assessment to be specified)

To ensure that the students get conceptual understanding of electro mechanical conversion in three phase and single phase induction motors through assessments and assignments.
To ensure that the students get practical exposure to analog and digital electronics circuits through individual/team task.
To expose the students about the application of electronic circuits in speed control of induction motors.

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



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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

FOR APPROVAL

Course Faculty N. Gopinath

CC- Chairperson

N. Chakraborty

HOD

S. K. Srinivasan



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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.

B.Tech. Admitted in				P.G.
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.