

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

COURSE OUTLINE			
Course Title	Applied Electrical and Electronics Engineering		
Course Code	CLPC12	No. of Credits	03
Department	Chemical Engineering	Faculty	Dr. P. RAJA
Pre-requisites Course Code	EE202, EE203, EE204		
Course Coordinator(s) (if, applicable)	Not Applicable		
Other Course Teacher(s)/Tutor(s) E-mail	Research Scholar / Temporary Faculty	Telephone No.	0431-250 3264 9942680653
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		

COURSE OVERVIEW

The pervasive presence of electrical and electronic appliances/devices in all aspects of engineering design and analysis is one of the manifestations of the engineering revolution that has characterized the second half of 20th century. Every aspect of engineering practice, and even of everyday life, has been affected in some way or another by Electrical and Electronic devices and instruments. Hence any engineering graduate/practicing engineer, from mechanical to chemical, nuclear, civil and biomedical engineering should have an irrespective of the discipline of study should have an exposure on the field of Electrical, Electronic and Computer engineering to communicate effectively within the interdisciplinary team in which they are going to work/practice.

To align with the above said requirement, this course is designed for Chemical Engineering students such a way that it covers various control techniques and testing for electrical motors used in various industries. The other part of the syllabus engages the digital logic circuit design. Finally the course introduces basic assembly language programming in an 8085 microprocessor. This entire course mainly focuses on design level concepts mainly needed for industry environment.

COURSE OBJECTIVES

- To provide the key concepts about Transformers, DC and AC motors and thereby able to choose the appropriate drives for various applications.
- To equip students to understand and apply the basic concepts of Combinational logic circuits and INTEL 8085 Microprocessor.

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
Upon completion of the course the students would be able to	
1. Analyze the performance of DC Motors and Transformers under various operating conditions using their various characteristics	1,4,5,7,9,10 & 12
2. Describe different types AC motors and their characteristics	1,3,4,5,7,9,10 & 12
3. Select appropriate drive for any industrial application	1,2,3,4,5,7,8, 9,10,11&12
4. Design and analyze combinational logic circuits	1,2,3,4,5,7,8, 9,10,&12
5. Understand the architecture and instruction set of 8085	1,2,3,4,5,7,9,10,11&12

COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week	Topic	Mode of Delivery
1	2 nd Week of July (11 th to 15 th July) (3 Contact Hours)	Course plan details Diagnostic Test (Objective Type) Basics of Transformer and Equivalent circuit	Discussion, Interactive Session Lecture L&T
2	3 rd Week of July (18 th to 22 nd July) (3 Contact Hours)	Transformers Losses and Efficiency	Lecture C&T
3	4 th Week of July (25 th to 29 th July) (3 Contact Hours)	DC Motors: Types and Characteristics	Lecture C&T
4	1 st Week of August (1 st to 5 th August) (3 Contact Hours)	DC Motor: Starting and Speed Control	Lecture C&T
5	2 nd Week of August (8 th to 12 th August) (2 Contact Hours)	DC Motors : Testing and Applications Assessment I	Lecture C&T Objective Type
6	3 rd Week of August (15 th to 19 th August) (3 Contact Hours)	Three-phase induction motor: Principle and Types	Lecture C&T
7	4 th Week of August (22 nd to 26 th August) (3 Contact Hours)	Three-phase induction motor: Torque-speed Characteristics Compensation Assessment I	Lecture C&T Written Test
8	5 th Week of August (29 th August to 2 nd Sep) (3 Contact Hours)	Three-phase induction motor: Starting and Speed Control	Lecture C&T and PPT
9	2 nd Week of September (5 th to 9 th Sep) (3 Contact Hours)	Single-phase induction motors and Universal Motors	Lecture C&T and PPT
10	3 rd Week of September (12 th to 16 th Sep) (3 Contact Hours)	Synchronous Motor : Starting and Applications	Lecture C&T and PPT
11	4 th Week of September (19 th to 23 rd Sep) (2 Contact Hours)	Electric Drives for various industrial applications Assessment II	Lecture C&T and PPT Objective Type Test
12	5 th Week of September (26 th to 30 th Sep.) (3 Contact Hours)	Combinational Logic : Representation of Logic functions, SOP and POS forms Introduction to K-maps Compensation Assessment II	Lecture C&T Written Test

13	1 st Week of October (3 rd to 7 th Oct) (2 Contact Hours)	Minimization of K-maps and implementation of logic functions Assessment III	Lecture C&T Group Task - I
14	2 nd Week of October (10 th to 14 th Oct) (2 Contact Hours)	Multiplexer and Demultiplexer Adders and Subtractors Assessment IV	Lecture C&T Group Task - II
15	3 rd Week of October (17 th to 21 st Oct.) (3 Contact Hours)	Code Converters and Memory Microprocessor Architecture : 8085	Lecture C&T
16	4 th Week of October (24 th to 28 th Oct.) (3 Contact Hours)	Microprocessor Instruction set and Assembly language programming: 8085	Lecture C&T and PPT
17	1 st Week of November (31 st Oct. to 4 th Nov.)	Assessment V	Group Task - III
18	2 nd Week of Nov. (7 th to 11 th Nov.)	Compensation Assessment III	Written Test
19	3 rd Week of November (14 th to 18 th Nov.)	ASSESSMENT VI	Descriptive Written Exam

C&T : Chalk and Talk
PPT : Power Point

COURSE ASSESSMENT METHODS

Asst. No.	Mode of Assessment	Week/Date	Duration	% Weightage
I	Objective Type Test I	2 nd Week of August	30 Minutes	10
II	Objective Type Test II	4 th Week of September	60 Minutes	20
III	Group Task I	1 st Week of October	Each Batch 10 Mints.	10
IV	Group Task II	2 nd Week of October	Each Batch 15 mints.	10
V	Group Task III	1 st Week of November	30 minutes	10
VI	Descriptive Type Examination (End Semester)	3 rd Week of November	120 Minutes	40

Compensation Assessment I and II are for Assessment I and II respectively. Compensation Assessment III is for Assessments III, IV and V. For further details go through the Courser policy.

ESSENTIAL READINGS : Textbooks, Reference Books Website addresses, journals, etc.

1. Theraja B L, Theraja A K, Textbook of Electrical Technology, S Chand publisher, 23rd Edition, 2007.
2. Dubey G K, Fundamentals of Electric Drives, Narosa Book Distributors, 2nd Edition, 2012.
3. Morris Mano and Michael S Ciletti, Digital Design, Pearson Education, 2nd Edition, 2009.
4. Ramesh S Gaonkar, Microprocessor Architecture Programming and Applications with 8085, Penram Intl. Publishing, 6th Edition, 2013.

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

- Feedback from the students during class committee meetings
- Anonymous feedback through questionnaire (Mid of the semester & End of the semester)
- End semester feedback on Course Outcomes

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

CORRESPONDENCE

1. All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through their webmail only.
2. Queries (if required) to the course teacher shall only be emailed to chem.aeenitt@gmail.com

ATTENDANCE

1. Attendance will be taken by the faculty in all the contact hours.
2. Maintaining overall 75 % of minimum attendance is one of the essential eligible criteria to attend the Assessment VI.
3. A Student who neither maintain minimum 75% of attendance in the mentioned contact hours nor maintain overall 60 % of minimum assessment mark (out of assessments I, II, III, IV and V) will have to RE DO the course.

ASSESSMENT

1. Attending all the assessments is **MANADATORY** for every student.
2. If a student is not able to attend the continuous assessments (CAs) I and II due to genuine reason and/or with prior permission, student is permitted to attend the compensation assessment (CPA) I and II respectively with % weightage equal to respective CAs.
3. If a student is not able to attend any one/ any two/ all the three continuous assessments of III, IV and V due to genuine reason and/or with prior permission, student is permitted to attend the compensation assessment III with % weightage of 20 marks. However the % of weightage considered for the calculation of the CA will be according to the number of missed assessments (III, IV and V).

4. A Student who either maintains minimum 75% of attendance in the mentioned contact hours or maintains overall 60 % of minimum assessment mark (out of assessments I, II, III, IV and V) is eligible to attend the Assessment VI.
5. Final grading will be based on the Academic regulation.

ACADEMIC HONESTY & PLAGIARISM

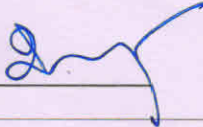

1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using study material in any form for copying during any assessments is considered dishonest.
2. Tendering of information such as giving one's program, simulation work, assignments to another student to use or copy is also considered dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD of the concerned department.
5. Students who honestly producing ORIGINAL and OUTSTANDING WORK will be REWARDED.

ADDITIONAL COURSE INFORMATION

The faculty is available for consultation at times as per the intimation given by the faculty.

Queries may also be emailed to the Course Coordinator directly at gmail.com

FOR APPROVAL

Course Faculty  CC-Chairperson  HOD 