

Department of Electronics and Communication Engineering
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Course Title	TRANSMISSION LINES AND WAVEGUIDES		
Course Code	ECPC16	No. of Credits	3
Department	ECE	Faculty	A. Josephine Pushpa Arasi
Pre-requisites Course Code	ECPC12 – Electrodynamics and Electromagnetic Waves		
Course Coordinator(s) (if, applicable)	Dr. R. Pandeewari		
Other Course Teacher(s)/Tutor(s) E-mail	-	E-mail/Telephone No.	<u>ajosephine@nitt.edu</u> 9894877315
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		

COURSE OVERVIEW

- To expose students to the complete fundamentals and essential feature of waveguides, resonators and microwave components and also able to give an introduction to microwave integrated circuit design.

COURSE OUTCOMES (CO)

Course Outcomes

1. Classify the Guided Wave solutions -TE, TM, and TEM.
2. Analyze and design rectangular waveguides and understand the propagation of electromagnetic waves.
3. Evaluate the resonance frequency of cavity Resonators and the associated modal field.
4. Analyze the transmission lines and their parameters using the Smith Chart.
5. Apply the knowledge to understand various planar transmission lines.

COURSE TEACHING AND LEARNING ACTIVITIES

S. No.	Week	Topic	Mode of Delivery
1.	First week of January (3 Contact Hours)	<ul style="list-style-type: none"> • Introduction to Transmission lines and waveguides. • Classification of guided wave solutions. 	Chalk &Talk, PPT or any suitable mode
2.	Second week of January (3 Contact Hours)	<ul style="list-style-type: none"> • TE Waves. • TM Waves. • TEM waves. 	
3.	Third week of January (3 Contact Hours)	<ul style="list-style-type: none"> • Field analysis transmission lines. • Rectangular waveguides. 	
4.	Fourth week of January (3 Contact Hours)	<ul style="list-style-type: none"> • Circular waveguides. • Excitation of waveguides 	
5.	First week of February (3 Contact Hours)	<ul style="list-style-type: none"> • Rectangular cavity resonators • Circular cavity resonators 	
6.	ASSESSMENT –I		Written exam
7.	Third week of February (3 Contact Hours)	<ul style="list-style-type: none"> • Transmission line equations. • Voltage and current waves. 	Chalk &Talk, PPT or any suitable mode
8.	Fourth week of February (3 Contact Hours)	<ul style="list-style-type: none"> • Solutions for different terminations. • Transmission-line loading. 	
9.	First week of March (3 Contact Hours)	<ul style="list-style-type: none"> • Impedance transformation and matching. • Smith Chart. 	
	ASSESSMENT –II		
10.	Second week of March (3 Contact Hours)	<ul style="list-style-type: none"> • Quarter-wave and half-wave transformers. • Binomial and Tchebyshev transformers. 	Chalk &Talk, PPT or any suitable mode
11.	Third week of March (3 Contact Hours)	<ul style="list-style-type: none"> • Single stub matching. • Double stub matching. • Triple stub matching. 	
12.	ASSESSMENT-III		Written exam
13.	First week of April (3 Contact Hours)	<ul style="list-style-type: none"> • Micro-striplines. • Stripline. 	Chalk &Talk, PPT or any suitable mode.
14.	Second week of April (3 Contact Hours)	<ul style="list-style-type: none"> • Slot lines. • Coplanar waveguide and fin line. 	
15.	Third week of April (3 Contact Hours)	<ul style="list-style-type: none"> • Micro strip MIC design aspects. • Computer- aided analysis and synthesis. 	

		COMPENSATION ASSESSMENT	Written exam
16.		FINAL ASSESSMENT	Descriptive type of exam

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	ASSESSMENT-I (Descriptive)	2 nd week of February'2017	60minutes	20
2.	ASSESSMENT-II (either Quiz or Assignments)	1 st week of March'2017	-	10
4.	ASSESSMENT-III (Descriptive)	4 th week of March'2017	60minutes	20
5.	COMPENSATION ASSESSMENT (CPA)	3 rd week of April'2017	60 minutes	Refer course policy
6.	FINAL ASSESSMENT (Descriptive type of exam)	First week of May'2017	180 minutes	50

ESSENTIAL READINGS :

Text Books:

1. D.M.Pozar, "Microwave Engineering (3/e)" Wiley, 2004.
2. J.D.Ryder, "Networks, Lines and Fields", PHI, 2003.

Reference Books:

1. R.E.Collin, "Foundations for Microwave Engineering (2/e)", McGraw-Hill, 2002.
2. S.Y.Liao, "Microwave Devices and Circuits", (3/e) PHI, 2005.
3. J. A. Seeger, "Microwave Theory, Components, and Devices" Prentice-Hall-A division of Simon & Schuster Inc Englewood Cliffs, New Jersey 07632, 1986.

COURSE EXIT SURVEY

1. Feedback from the students during class committee meeting.
2. Queries through questionnaire.
3. Course Attainment is calculated through Direct tools (Exams)

COURSE POLICY

Correspondence:

1. All the students are advised to come to class regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be intimated in the class / over phone.
2. Queries (if required) to the course teacher shall be emailed to the email id specified.

Attendance:

1. Attendance will be taken by the faculty in all the contact hours. Every student should maintain minimum 75 % physical attendance (on other duty will not be considered) in these contact hours to attend the end semester examination.
2. Any student, who fails to maintain the minimum 75% attendance but has attendance between 50% and 75%, will be eligible for attending the end semester examination provided if he/she appears for the compensation assessment (CPA) and scores more than 60 % marks in the CPA. Otherwise, they will have to REDO the course.
3. Students having attendance less than 50% at the end of the semester will have to RE DO the course.

Assessment:

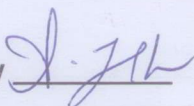
1. Attending all the assessments is MANDATORY for every student.
2. If any student is not able to attend either one or both of the continuous assessments I & III due to genuine reason, student is permitted to attend the compensation assessment (CPA) with only 20 % weightage for both the cases.
3. At any case, CPA will not be considered as an improvement test.
4. If any student is not able to attend the End semester due to genuine reason with valid attestation, student is permitted to take up FORMATIVE ASSESSMENT.
5. Finally, every student is expected to score minimum 35% of the mark of the class in the total assessment (1, 2, 3 and end semester) to pass the course. Otherwise the student would be declared fail and 'F' grade will be awarded. Further the student can take up only FORMATIVE ASSESSMENT.

ADDITIONAL COURSE INFORMATION

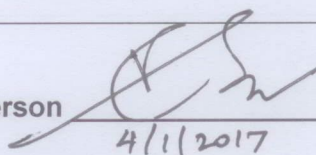
Queries and feedback may also be emailed to the Course Faculty directly at ajosephine@nitt.edu

FOR SENATE'S CONSIDERATION

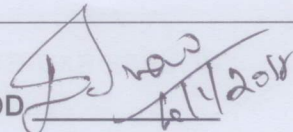
Course Faculty



CC-Chairperson


4/1/2017

HOD


6/1/2018