NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	**B- Tech**		
Course Title	**WIRELESS COMMUNICATION**		
Course Code	**ECMI27**	**No. of Credits**	**03**
Course Code of Pre-requisite subject(s)	**-**		
Session	**Jan. 2019**	**Section (if, applicable)**	**A**
Name of Faculty	**Dr.G.Gandhimathi**	**Department**	**Electronics And Communication Engineering**
Email	**ggandhimathi12@gmail.com gandhimathi@nitt.edu**	**Telephone No.**	**09790035798**
Name of Course Coordinator(s) (if, applicable)	**-**		
E-mail	**-**	**Telephone No.**	
Course Type	**Minor course**		

Syllabus (approved in BoS)

Introduction to Wireless Communication. Cellular concept. System design fundamentals. Coverage and Capacity improvement in Cellular system. Technical Challenges.

Mobile Radio Propagation; Reflection, Diffraction, Fading. Multipath propagation. Statistical characterization of multipath fading. Diversity Techniques.

Path loss prediction over hilly terrain. Practical link budget design using Path loss models. Design parameters at base station. Antenna location, spacing, heights and configurations.

Multiple access techniques; FDMA, TDMA and CDMA. Spread spectrum. Power control. WCDMA.CDMA network design. OFDM and MC-CDMA.

GSM.3G,4G(LTE), NFC systems,. WLAN technology. WLL. Hiper-LAN. Adhoc networks. Bluetooth.

Text Books:

1. T.S.Rappaport, Wireless Communication Principles (2/e), Pearson, 2002.
2. A.F.Molisch, Wireless Communications, Wiley, 2005.

Reference Books:

1. P.MuthuChidambaraNathan, Wireless Communications, PHI, 2008.
2. W.C.Y.Lee, Mobile Communication Engineering. (2/e), McGraw- Hill,1998.
3. A.Goldsmith, Wireless Communications, Cambridge University Press, 2005.
4. S.G.Glisic, Adaptive CDMA, Wiley, 2003.

COURSE OBJECTIVES

To get an understanding of mobile radio communication principles, types and to study the recent trends adopted in cellular and wireless systems and standards**.**

COURSE OUTCOMES (CO)

Course Outcomes	**Aligned Programme Outcomes (PO)**
CO1: Apply the knowledge of basic communication systems and its principles.	**PO1,PO2,PO6,PO7**
CO2: Describe the cellular concept and analyze capacity improvement Techniques.	**PO1,PO2,PO6,PO7**
CO3: Mathematically analyze mobile radio propagation mechanisms.	**PO1,PO2,PO6,PO7 , PO11,**
CO4: Summarize diversity reception techniques.	**PO3 PO6, PO11**
CO5: Design Base Station (BS) parameters and analyze the antenna configurations.	**PO3 PO6, PO11**
CO6: Analyze and examine the multiple access techniques and its application.	**PO2,PO3, PO6,PO7, PO11**
CO7: Assess the latest wireless technologies.	**PO11, PO12**

COURSE PLAN – PART II

COURSE OVERVIEW

Students get exposure to the concepts of Cellular System design, Coverage and Capacity improvement, Mobile Radio Propagation, Diversity Techniques. Students will understand the Path loss models, Antenna location spacing, heights and configurations, then Multiple access techniques. Further they will be exposed to various wireless networks.

COURSE TEACHING AND LEARNING ACTIVITIES			(Add more rows)
S.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1	1st week	Introduction to Wireless Communication. Cellular concept.	C&T/PPT or any suitable mode
2	2nd week	System design fundamentals Coverage and Capacity improvement in Cellular system. Technical Challenges.	C&T/PPT or any suitable mode
3	3rd week	Mobile Radio Propagation; Reflection, Diffraction, Fading	C&T/PPT or any suitable mode
4	4th week	Multipath propagation. Statistical characterization of multipath fading	C&T/PPT or any suitable mode
5	5th week	Diversity Techniques.	C&T/PPT or any suitable mode
6	6th week	Path loss prediction over hilly terrain.	C&T/PPT or any suitable mode
7	7th week	Practical link budget design using Path loss models.	C&T/PPT or any suitable mode
8	8th week	Design parameters at base station. Antenna location, spacing, heights and configurations.	C&T/PPT or any suitable mode
9	9th week	Multiple access techniques; FDMA, TDMA and CDMA. Spread spectrum.	C&T/PPT or any suitable mode
10	10th week	Power control. WCDMA. CDMA network design.	C&T/PPT or any suitable mode
11	11th week	OFDM and MC-CDMA.	C&T/PPT or any suitable mode

12	12th week	GSM.3G,4G(LTE), NFC systems	C&T/PPT or any suitable mode
13	13th week	WLAN technology. WLL.	C&T/PPT or any suitable mode
14	14th week	Hiper LAN. Ad hoc networks. Bluetooth.	C&T/PPT or any suitable mode

COURSE ASSESSMENT METHODS (shall range from 4 to 6**)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assignment – 1	1st week of February	-	10
2	Assessment – 1	3rd week of February	60 mins	20
3	Assessment – 2	4th week of March	60 mins	20
4	Compensation Assessment*	3rd week of April	60 mins	20
5	Final Assessment *	1st week of May	180 mins	50

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

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

1. Feed back from students during class committee meetings.
2. Anonymous feedback through questionnaire.

COURSE POLICY (including compensation assessment to be specified**)**

- All the students are advised to check their NITT WEBMAIL/group mail/suggested by the course faculty, class representative regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through them only.
- Queries (if required) to the course teacher shall only be emailed to the email id specified by the teacher.
- Valid reasons for student's absence in either or both of the assessments would be taken for consideration of compensation assessment.
- Improvement in marks will not be considered a criterion for compensation assessment.

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

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

FOR APPROVAL

Course Faculty _____ **CC- Chairperson** R.P. 1/2/19 **HOD** B. V. 9/2/19

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.