TCET/FRM/IP-02/09 **Semester Plan (Theory)** **Revision: A**

Semester: V **Course: ETRX**

Subject: : EXC503: : Electromagnetic Engineering **Class: TE ETRX**

S.No.	Prerequisite/ Bridge course:	Duration (Week /Hrs)	Modes of Learning	Recommended Sources
1	Knowledge of Vector Calculus, Cylindrical and Spherical coordinate systems	4	Reading of Book &Soving Problems	Fundamentals of Electromagnetics for Engineering

Class Room Teaching

Sr. No	Module No.	Lesson No	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
1	SOP	L1.1	EME (theory)	Power point presentation, Chalk & Board	11.07.17 ---------- 11.07.17		
2	SOP	L1.2	EME (OBE)	Power point presentation, Chalk & Board	11.07.17 ---------- /11.07.17		
3	Module 1	L2.1	Coulombs law Gauss law	Power point presentation, Chalk & Board	17.07.17	1.7.1	
4	Module 1	L2.2	Bio-Savarts law Amperes law	Power point presentation, Chalk & Board	18.07.17 ----------	1.7.2	
5	Module 1	L2.3	Poissions and Laplace Equations	Power point presentation, Chalk & Board	19.07.17	1.7.3	
6	Module 1	L2.4	Boundary conditions for static electric and magnetic fields	Chalk & Board, Animation	21.07.17	1.7.4	
7	Module 1	L3.1	Boundary conditions for static electric and magnetic fields	Power point presentation, Chalk & Board	24.07.17	1.7.5	
8	Module 1	L3.2	Numerical (1-5)	Chalk & Board, Animation	25.07.17	1.7.6	
9	Module 1	L3.3	Maxwell Equations: Integral and differential form static and time varying fields and its interpretations	Power point presentation, Chalk & Board	26.07.17	1.7.7	
10	Module 1	L3.4	Maxwell Equations: Integral and differential form static and time varying fields and its interpretations	Power point presentation, Chalk & Board	28.07.17	1.7.8	
11	Module 1	L4.1	Numerical (7-8)	Power point presentation, Chalk & Board	31.07.17	1.7.9	
12	Module 2	L4.2	Wave equation: Derivation and its solution in cartesian co-ordinates	Power point presentation, Chalk & Board	01.08.17	2.7.1	
13	Module 2	L4.3	Wave equation: Derivation and its solution in cartesian co-ordinates	Power point presentation, Chalk & Board	02.08.17	2.7.2	
14	Module 2	L4.4	Solution of wave equations: Partially conducting media	Power point presentation, Chalk & Board	04.08.17	2.7.2	
15	Module 2	L5.1	Solution of wave equations: Partially conducting media	Chalk & Board, Animation	07.08.17	2.7.4	
16	Module 2	L5.2	Electromagnetic Power: Poynting Vector and power flow in free space and in dielectric, conducting media	Power point presentation, Chalk & Board	08.08.17	2.7.5	
17	Module 2	L5.3	Polarization of wave: Linear, Circular and Elliptical	Power point presentation, Chalk & Board	09.08.17	2.7.6	

18	Module 2	L5.4	Behavior of waves for normal and oblique incidence in dielectrics and conducting media, propagation in	Power point presentation, Chalk & Board	11.08.17	2.7.7	
19	Module 2	L6.1	normal and oblique incidence in dielectrics and conducting media, propagation in dispersive media	Power point presentation, Chalk & Board	14.08.17	2.7.8	
20	Module 4	L6.2	Antenna Parameters: Radiation Intensity, directive gain, directivity, power gain beam width, gain and	Power point presentation, Chalk & Board	16.08.17	4.7.1	
21	Module 4	L6.3	Antenna Parameters: Radiation Intensity, directive gain, directivity, power gain beam width, gain and	Power point presentation, Chalk & Board	18.08.17	4.7.1	
22	Module 4	L8.1	Half- Wave dipole and Folded dipole Reciprocity Principle, effective length and effective area	Power point presentation, Chalk & Board	30.08.17	4.7.2	
23	Module 4	L8.2	Half- Wave dipole and Folded dipole Reciprocity Principle, effective length and	Power point presentation, Chalk & Board	01.09.17	4.7.3 -4.7.4	
24	Module 4	L9.1	Half- Wave dipole and Folded dipole Reciprocity Principle, effective length and effective area	Power point presentation, Chalk & Board	04.09.17	4.7.5	
25	Module 4	L9.2	Radiation from small loop and its radiation resistance ,Helical Antenna	Power point presentation, Chalk & Board	05.09.17	4.7.6	
26	Module 4	L9.3	Radiation from small loop and its radiation resistance ,Helical Antenna	Power point presentation, Chalk & Board	06.09.17	4.7.6	
27	Module 4	L9.4	Radiation from small loop and its radiation resistance ,Helical Antenna	Power point presentation, Chalk & Board	08.09.17	4.7.8	
28	Module 5	L10.1	Types of wave propagation :.Ground ,space and surface wave propagation,	Power point presentation, Chalk & Board	11.09.17	5.7.1	
29	Module 5	L10.2	Types of wave propagation, tilt and surface wave ,	Chalk & Board, Animation	12.09.17	5.7.2	
30	Module 5	L10.3	Types of wave propagation ,impact of imperfect earth and earth's behavior at different frequencies	Power point presentation, Chalk & Board	13.09.17	5.7.3	
31	Module 5	L10.4	Space Wave Propagation: Effect of imperfection of earth ,curvature of earth	Power point presentation, Chalk & Board	15.09.17	5.7.4	
32	Module 5	L11.1	Space Wave Propagation:,effect of interference zone ,showing effect of hills and buildings	Power point presentation, Chalk & Board	18.09.17	5.7.5	
33	Module 5	L11.2	Space Wave Propagation: ,Super retraction ,scattering phenomena, troposphere propagation and fading	Chalk & Board, Animation	19.09.17	5.7.6	
34	Module 5	L11.3	Measure of Ionosphere Propagation: Critical frequency ,angle of incidence, maximum unstable frequency, skip distance, virtual height	Power point presentation, Chalk & Board	20.09.17	5.7.7	
35	Module 5	L11.4	Measure of Ionosphere Propagation: Critical frequency ,angle of incidence, maximum unstable frequency, skip distance, virtual height	Chalk & Board, Animation	22.09.17	5.7.8	
36	Module 5	L12.1	Measure of Ionosphere Propagation: Critical frequency ,angle of incidence, maximum unstable frequency, skip distance, virtual height Variation in ionosphere	Chalk & Board, Animation	25.09.17	4.7.8	
37	Module 3	L12.2	concept of vector potential- Fields associated with Hertzian dipole	Power point presentation, Chalk & Board	26.09.17	3.7.1	
38	Module 3	L12.3	Radiation resistance of elementary dipole with linear current distribution ,radiation from half-wave dipole and quarter wave mono dipole	Power point presentation, Chalk & Board	27.09.17	3..7.2	

39	Module 3	L12.4	Finite Difference Method (FDM):Neumann type,and Mixed boundary conditions ,Iterative solution of finite difference equation ,solution using band matrix method	Power point presentation, Chalk & Board	29.09.17	3..7.3	
40	Module 3	L13.1	Finite Difference Method (FDM):Neumann type,and Mixed boundary conditions ,Iterative solution of finite difference equation ,solution using band matrix method	Power point presentation, Chalk & Board	03.10.17	3..7.3	
41	Module 3	L13.2	Finite Element Method(FEM): triangular mesh configuration ,finite element discretization, element governing equations assembling all equations and solving resulting equations	Power point presentation, Chalk & Board	04.10.17	3..7.4	
42	Module 3	L13.3	Finite Element Method(FEM): triangular mesh configuration ,finite element discretization, element governing equations assembling all equations and solving resulting equations	Power point presentation, Chalk & Board	06.10.17	3.7.5	
43	Module 3	L14.1	Method of Moment (MOM):field calculations of conducting wire ,parallel conducting wire	Power point presentation, Chalk & Board	13.10.17		
44	Module 3	L15.1	Method of Moment (MOM):field calculations of conducting wire ,parallel conducting wire	Power point presentation, Chalk & Board	16.10.17		
45	Revision	L3.5	MOD-1(UoM QUE-ANS)	Power point presentation, Chalk & Board	29.07.17		
46	Revision	L5.5	MOD-1(UoM QUE-ANS)	Power point presentation, Chalk & Board	05.08.17		
47	Revision	L6.4	MOD-2(UoM QUE-ANS)	Power point presentation, Chalk & Board	19.08.17		
48	Revision	L8.3	MOD-3(UoM QUE-ANS)	Power point presentation, Chalk & Board	02.09.17		
49	Revision	L10.5	MOD-4(UoM QUE-ANS)	Power point presentation, Chalk & Board	16.09.17		
50	Revision	L11.5	MOD-5(UoM QUE-ANS)	Power point presentation, Chalk & Board	23.09.17		
51	Revision	L13.4	MOD-5(UoM QUE-ANS)	Power point presentation, Chalk & Board	30.09.17		
52	Revision	L15.2	MOD-5(UoM QUE-ANS)	Power point presentation, Chalk & Board	17.10.17		
Remark:		Syllabus Coverage:		Practice Session: 2		**Content Beyond Syllabus: -**	
Course:							
No. of (lectures planned)/(lecture taken): 52							

Advanced course: photonic Integrated Circuits	20 Hours	Online NPTEL videos with Hands on Training in Laboratory	**Web sources:** 1. NPTEL-https://onlinecourses.nptel.ac.in 2. www.tutorialpoint.com1. Instructor's study material, **Textbook reference:** 1. fiber optic Communication ,Harold Kolimbiris pearson

Text Books:

1.Recommended Books:

1. W.H. Hayt, and J.A. Buck, "Engineering Electromagnetics", McGraw Hill Publications, 7th Edition, 2006
2. R.K. Shevgaonkar, "Electromagnetic Waves", TATA McGraw Hill Companies, 3rd Edition, 2009
3. Edward C. Jordan and Keth G. Balmin, "Electromagnetic Waves and Radiating Systems", Pearson Publications, 2nd Edition, 2006
4. Matthew N.D. Sadiku, "Principles of Electromagnetics", Oxford International Student 4th Edition, 2007
5. J.D. Kraus, R.J. Marhefka, and A.S. Khan, "Antennas & Wave Propagation", McGraw Hill Publications, 4th Edition, 2011

Reference Books:

1. Fundamental of Electromagnetics for Egineering ,Pearson,N N Rao

Digital Reference:

3.1 www.nptel.ac.in

3.2 www.tutorialpoint.com

Name & Signature of Faculty Signature of HOD Signature of Principal /Dean (Academics)

Date: Date: Date:

Note:

1. Plan date and completion date should be in compliance
2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.
3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 55 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.
6. Text books and reference books are available in syllabus. Here only additional references w.r.t. non –digital/ digital sources can be written (if applicable)
7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.