TCET/FRM/IP-02/09 Revision: A

Semester Plan
(Theory)

Semester: VII Course: EXTC

Subject: Microwave and Radar Engineering Class: B.E -B

Sr. No	Prerequisite /Bridge Course	Duration(Hr/week)	Modes of learning	Recommended Resources
1	Electric field intensity(E),Electric flux density(D),Magnetic field intensity(H),Magnetic flux density(B),Gauss's Law for electric and magnetic field, Amperes Law's, Faraday's Law for electromagnetic Induction and Maxwell's Equation,P-N Junction, Diode .	4 hrs	Self learning and classroom revision	Elements of electromagnetic By Sadiku (Page No.103-155,261-296,369-404)

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
1			SOP Subject Orientation (TH)	M1: Black Board & chalks M2: Projector & Laptop	10/07/17		
2			SOP MWRE (OBE)	M1: Black Board & chalks	11/07/17		
4	1	L1.1	Frequency bands and characteristics of microwaves	M2: Projector & Laptop	14/7/17	1.7.1	
5	1	L1.2	Rectangular , mode analysis	M1: Black Board & chalks	17/7/17	1.7.2	
6	1	L1.2	circular waveguides, mode analysis	M2: Projector & Laptop	19/7/17	1.7.3	Instead of 2 lectures will be completed in 1 lectures
7	1	L1.3	Resonators, reentrant cavities, scattering parameters,	M1: Black Board & chalks	20/7/17	1.7.4	

8	1	L1.3	tees, hybrid ring, directional couplers, phase shifters,	M1: Black Board & chalks	21/7/17	1.7.5	
Sr. No	**Module No.**	**Lesson No.**	**Topics Planned (Technology to be used)**	**Teaching Aids Required**	**Planned /Completion Date**	**Resource Book Reference**	**Remark**
9	1	L1.3	terminations attenuators,	M1: Black Board & chalks	24/7/17	1.7.6	
10	1	L1.3	ferrite devices such as isolators,.	M1: Black Board & chalks	28/7/17	1.7.7	
11	1	L1.3	gyrators, and circulators	M1: Black Board & chalks	4/8/17	1.7.8	
12	2	L2.1	Lumped element matching	M1: Black Board & chalks ,M2: Projector & Laptop	7/8/17	2.7.1	
13	2	L2.2	Single stub tuning	M1: Black Board & chalks	11/8/17	2.7.2	
14	2	L2.2	double stub tuning	M1: Black Board & chalks	14/8/17	2.7.3	
15	2	L2.2	double stub tuning	M1: Black Board & chalks	18//8/17	2.7.4	
16	2	L2.2	triple stub tuning	M1: Black Board & chalks	25/8/17	2.7.5	
17	2	L2.3	Quarter wave transformer	M1: Black Board & chalks	28/8/17	2.7.6	
18	3	L3.1	Two Cavity Klystron	M1: Black Board & chalks ,M2: Projector & Laptop	1/9/17	3.7.1	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remark
19	3	L3.1	Reflex Klystron	M1: Black Board & chalks	4/9/17	3.7.2	
20	3	L3.2	Helix Travelling Wave Tube	M1: Black Board & chalks	8/9/17	3.7.3	
21	3	L3.2	Backward Wave Oscillator	M1: Black Board & chalks	11/9/17	3.7.4	
22	3	L3.3	Cross Field Amplifier	M1: Black Board & chalks	18/9/17	3.7.5	
23	3	L3.3	Cylindrical Magnetron,	M1: Black Board & chalks	22/9/17	3.7.6	
24	3	L3.3	Operation of Gyrotrons	M1: Black Board & chalks ,M2: Projector & Laptop	25/9/17	3.7.7	
25	4	L4.1	Basics of Semiconductor Devices	M1: Black Board & chalks ,M2: Projector & Laptop	12/7/17	4.7.1	
26	4	L4.2	Characteristics of Varactor and PIN diode	M1: Black Board & chalks ,M2: Projector & Laptop	18/7/17	4.7.1	
27	4	L4.3	Tunnel, Point Contact	M1: Black Board & chalks ,M2: Projector & Laptop	19/7/17	4.7.2	

27	4	L4.1	Schottky Barrier, Gunn,IMPATT.	M1: Black Board & chalks ,M2: Projector & Laptop	21/7/17	4.7.3	
Sr. No	**Module No.**	**Lesson No.**	**Topics Planned (Technology to be used)**	**Teaching Aids Required**	**Planned /Completion Date**	**Resource Book Reference**	**Remark**
28	4	L4.1	TRAPATT,BARITT.	M1: Black Board & chalks ,M2: Projector & Laptop	25/7/17	4.7.4	
29	4	L4.2	MESFET, BJT, Hetro junction BJT	M1: Black Board & chalks ,M2: Projector & Laptop	26/7/17	4.7.5	
30	4	L4.2	HEMT ,Parametric Amplifiers	M1: Black Board & chalks ,M2: Projector & Laptop	1/8/17	4.7.6	
31	5	L5.1	Basics of RADAR ,RADAR range equation	M1: Black Board & chalks ,M2: Projector & Laptop	2/8/17	5.7.1	Instead of 2 lecture will be completed in 1 lecture
32	5	L5.2	Types of RADAR: Pulsed,	M1: Black Board & chalks ,M2: Projector & Laptop	8/8/17	5.7.2	
33	5	L5.2	Types of RADAR: Continuous wave	M1: Black Board & chalks ,M2: Projector & Laptop	9/8/17	5.7.3	
34	5	L5.2	Types of RADAR : FMCW	M1: Black Board & chalks ,M2: Projector & Laptop	16/8/17	5.7.4	
35	5	L5.2	Types of RADAR : Doppler, MTI,	M1: Black Board & chalks ,M2: Projector & Laptop	30/8/17	5.7.5	

36	5	L5.2	Types of RADAR : Phased Array	M1: Black Board & chalks ,M2: Projector & Laptop	5/9/17	5.7.6	
Sr. No	**Module No.**	**Lesson No.**	**Topics Planned (Technology to be used)**	**Teaching Aids Required**	**Planned /Completion Date**	**Resource Book Reference**	**Remark**
37	5	L5.3	Types of displays and Clutter	M1: Black Board & chalks ,M2: Projector & Laptop	6/9/17	5.7.7	
38	5	L5.4	Tracking RADAR: Mono pulse	M1: Black Board & chalks ,M2: Projector & Laptop	12/9/17	5.7.8	
39	5	L5.4	Tracking RADAR: Conical,	M1: Black Board & chalks ,M2: Projector & Laptop	13/9/17	5.7.9	
40	5	L5.4	Tracking RADAR: Sequential lobbing	M1: Black Board & chalks ,M2: Projector & Laptop	19/9/17	5.7.10	
41	6	L6.1	Microwave heating and	M1: Black Board & chalks ,M2: Projector & Laptop	20/9/17	6.7.1	
42	6	L6.1	bio-medical applications	M1: Black Board & chalks ,M2: Projector & Laptop	26/9/17	6.7.2	
43	6	L6.2	Remote sensing RADAR	M1: Black Board & chalks ,M2: Projector & Laptop	3/10/17	6.7.3	
44	6	L6.2	MSTRADAR, radiometer	M1: Black Board & chalks ,M2: Projector & Laptop	4/10/17	6.7.4	

45	6	L6.2	instrumentation landing system RADAR based navigation	M1: Black Board & chalks ,M2: Projector & Laptop	17/10/17	6.7.4	
Sr. No	**Module No.**	**Lesson No.**	**Topics Planned (Technology to be used)**	**Teaching Aids Required**	**Planned /Completion Date**	**Resource Book Reference**	**Remarks**
46			University Question solving	M1: Black Board & chalks ,M2: Projector & Laptop	6/10/17		
47			University Question solving	M1: Black Board & chalks ,M2: Projector & Laptop	13/10/17		
48			University Question solving	M1: Black Board & chalks ,M2: Projector & Laptop	17/10/17		
Remark:: Course:		**Syllabus Coverage:**		**Practice Session:**		**Beyond Syllabus: Beyond Syllabus: Introduction to MEMS &SOC**	
No. of (lectures planned)/(lecture taken):							

Sr. No		**Duration(Hr/week)**	**Modes of learning**	**Recommended Resources**
1	Advanced course: MEMS and Microsystems	12 week	NPTEL videos with hands on training in Laboratory	1.: http://nptel.ac.in/courses/117105082 2. "Microsystem Design" by Stephen D. Senturia 2) "Fundamentals of Microfabrication" by Marc Madou

Text Books:

1. David M Pozar, —Microwave Engineering‖, John Wieley & Sons,Inc. Hobokenh,New Jersey, Fourth Edition, 2012.
2. Samuel YLiao, —Microwave Devices and Circuits‖, Pearson Education, Third Edition

Reference Books:

1. Merill Skolnik, —Introduction to RADAR Systems‖, TataMcgraw Hill , Third Edition
2. Annapurna Das and Sisir K Das, —Microwave Engineering‖, Tata McGraw Hill,New Delhi, Second Edition, 2009
3. K. T. Matthew, —Microwave Engineering‖, Wieleyindia, ,2011

Digital Reference:

1. http://nptel.ac.in/courses/117101119/
2. http://nptel.ac.in/courses/117105130/
3. http://nptel.ac.in/courses/117105130/

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Dr.Vineetkumar Dongre
Mr. Deepak Singh Dr.Vineetkumar Dongre Dr.R.R.Sedamkar
Name & Signature of Faculty Signature of HOD Signature of Dean (Academics)

Date: Date: Date:

M1: Lecture interspersed with discussions
M2: Lecture with visual annotations

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.