SWAMI VIVEKANAND SUBHARTI UNIVERSITY, MEERUT

SUBHARTI INSTITUTE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

M.TECH

[ODD & EVEN SEMESTER]

PROGRAM OUTCOMES (POS)

PO 1:

Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2:

Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3:

Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4:

Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5:

Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO 6:

The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7:

Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8:

Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9:

Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10:

Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11:

Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12:

Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

1st SEMESTER

SUBJECT NAME: <u>COGNITIVE RADIO</u>

SUBJECT CODE: MMW-112

YEAR/SEMESTER: 1st /1st

COURSE OUTCOME:

CO1	To Understand the fundamental concepts of cognitive radio networks.
CO2	To Understand technologies to allow an efficient use of TVWS for radio communications based on two spectrum sharing business models/policies.
CO3	To Develop the optimization techniques of Dynamic Spectrum Allocation.
CO4	Understand fundamental issues regarding dynamic spectrum access, the radio-resource management and trading, as well as a number of optimisation techniques.
CO5	To develop a clear insight spectrum trading (introduction, classification, economic theories DSA) and auctions.

SUBJECT NAME: <u>WIRELESS & MOBILE COMMUNICATION</u>

SUBJECT CODE: MMW-113

YEAR/SEMESTER: 1ST /1ST

COURSE OUTCOME:

CO1	Understand the concept of cellular Communication and apply the concept of frequency reuse in Mobile Communication.
CO2	Understand and differentiate the various multiple access techniques with their advantages and disadvantages
CO3	Evaluate path loss for large scale and small scale fading with various propogation models
CO4	Understand the concept of Equalization and also know about the upcoming technologies 3G, 4G etc

| CO5	Study and design the CDMA System with knowledge of forward and reverse channel details, advantages and disadvantages of using the technology.

SUBJECT NAME: **RF AND MICROWAVE CIRCUIT DESIGN**

SUBJECT CODE: MMW-101

YEAR/SEMESTER: /1ST/1ST

COURSE OUTCOME:

CO1	Understand the behavior of RF passive components and model active components.
CO2	Perform transmission line analysis.
CO3	Demonstrate use of Smith Chart for high frequency circuit design.
CO4	Justify the choice/selection of components from the design aspects.
CO5	Contribute in the areas of RF circuit design.
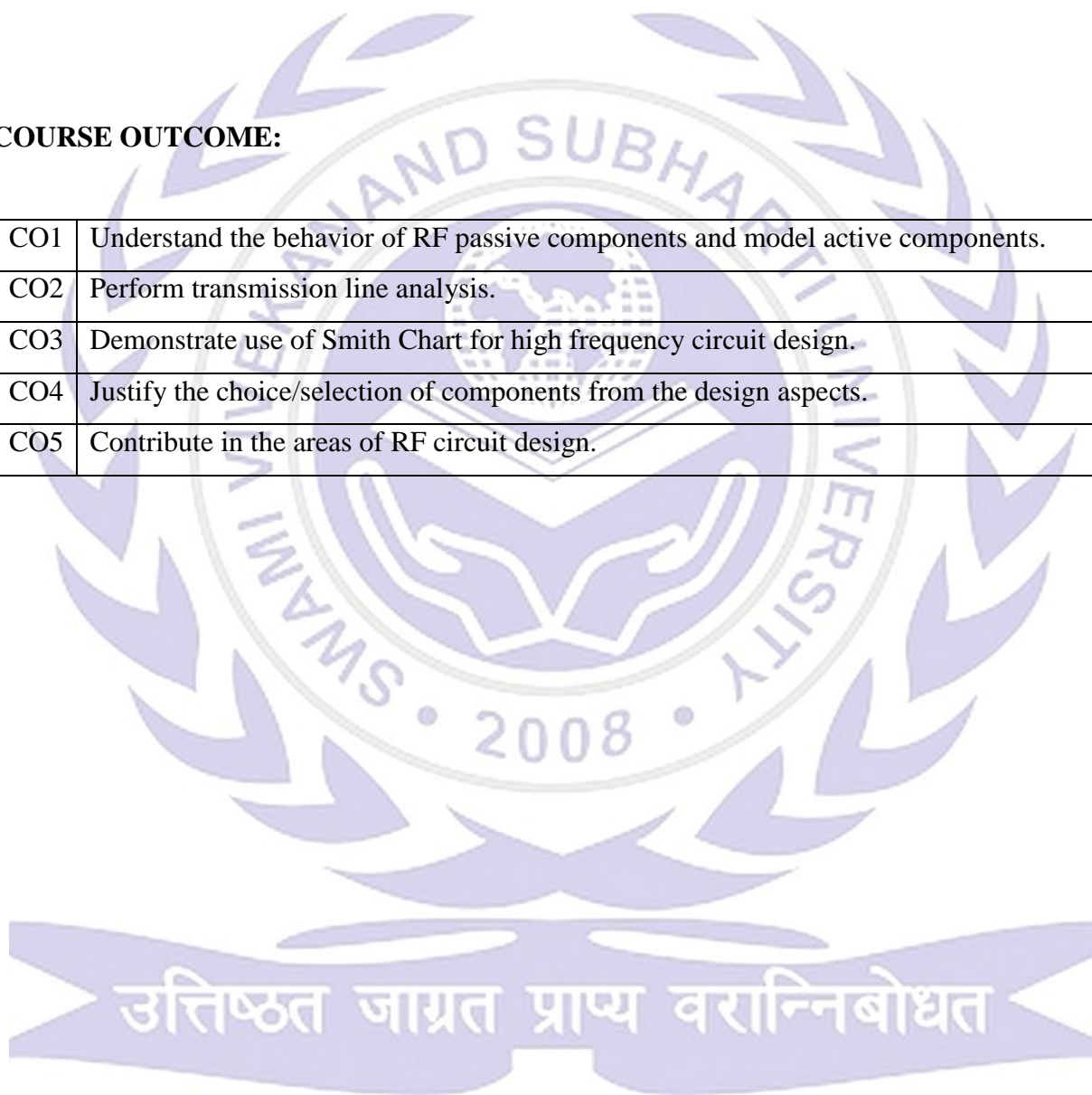
SUBJECT NAME: **ANTENNA AND RADIATING SYSTEM**

SUBJECT CODE: MMW-201

YEAR/SEMESTER: 1st /2nd

COURSE OUTCOME:

CO1	Understand the Antenna types, radiation pattern and gain of antenna for given current distribution
CO2	Understands the Linear wire Antennas & Loop Antennas.
CO3	Compute the array factor for an array of identical antennas.
CO4	Understands the Aperture Antennas & Horn Antennas
CO5	Design Microstrip Antennas & Reflector Antennas

SUBJECT NAME: **COMMUNICATION SYSTEM**

SUBJECT CODE: MMW-202

YEAR/SEMESTER: 1st/2 nd

COURSE OUTCOME:

CO1	Understand the concept of communication system and also analyse the storage and delivery of the information.
CO2	Understand the concept of modulation along with the different types of modulation and demodulation methods used for the communication
CO3	Understanding the concept of probability and also define the random variables and process required for communication.
CO4	Have detailed understanding of sampling theorem along with the concept of quantization and pulse code modulation system.
CO5	Have detailed knowledge of information theory and coding for error correction and detection.

SUBJECT NAME: <u>ADVANCED DIGITAL SIGNAL PROCESSING</u>

SUBJECT CODE: MMW-212

YEAR/SEMESTER: 1st /2nd

COURSE OUTCOME:

CO1	Understand the basic theory of different digital filter with their design, structure and algorithm.
CO2	Explore theory of multi rate DSP, solve numerical problems based on it and write various algorithms and their application to RADAR, Wavelets and Image Processing.
CO3	To study theory of forward and backward linear predication filters, optimum linear filters and solution of normal equation.
CO4	To explore the application of adaptive filters and their applications.
CO5	Study non-parametric and parametric methods for Power spectrum Estimation.

SUBJECT NAME: CAD OF RF & MICROWAVE CIRCUIT

SUBJECT CODE: MMW-211

YEAR/SEMESTER: 2ND /4TH

COURSE OUTCOME:

CO1	Recognize the limitations of existing vacuum tubes and solid state devices at microwave frequencies.
CO2	Study the performance of specialized microwave tubes such as klystron, reflex klystron, magnetron and Travelling wave tube.
CO3	Understand the operation of passive waveguide components.
CO4	Analyze microwave circuits using scattering parameters.
CO5	Test microwave components and circuits with standard microwave bench and vector network analyzer.

SUBJECT NAME: <u>MICROWAVE ENGINEERING LAB</u>

SUBJECT CODE: MMW-252 SESSION: 2018-19

YEAR/SEMESTER: 1ˢᵗ /2ⁿᵈ

COURSE OUTCOME:

CO1	Demonstrate the characteristics of Microwave sources
CO2	Demonstrate the characteristics of directional Couplers.
CO3	To test the characteristics of microwave components.
CO4	To analyze the radiation pattern of antenna.
CO5	Practice microwave measurement procedures.

SUBJECT NAME: <u>**COMPUTATIONAL ELECTROMAGNETICS**</u>

SUBJECT CODE: MMW-301

YEAR/SEMESTER: 2ND /3RD

COURSE OUTCOME:

CO1	To Understand the fundamental concepts of cognitive radio networks using Maxwell's equations and wave equations.
CO2	To develop the concept of Finite element method and galerkin methods for the static solution.
CO3	To apply the dynamic solution for deriving the boundary value problem linear shape functions under 1D FEM.
CO4	To understand fundamental issues regarding reactional form of the wave equation and shape function on triangle under 2D.
CO5	To develop a clear insight 3D Finite Elements shape functions like Tetraheron, Hexahedron, and Prisms Numerical Integration.

SUBJECT NAME: <u>**DISSERTATION PHASE-1**</u>

SUBJECT CODE: MMW-351

YEAR/SEMESTER: 2ND/3RD.

COURSE OUTCOME:

CO1	Apply critical and creative thinking in the design of engineering projects, Plan and manage your time effectively as a team
CO2	Consider the business context and commercial positioning of designed devices or systems and apply knowledge of the 'real world' situations that a professional engineer can encounter
CO3	Use fundamental knowledge and skills in engineering and apply it effectively on a project and design and develop a functional product prototype while working in a team
CO4	Undertake an engineering project under mentorship and timely reflect on your own and peers' technical and non-technical learning
CO5	Orally present and demonstrate your product to peers, academics, general and industry community and Manage any disputes and conflicts within and outside your team.

4TH SEMESTER

SUBJECT NAME: <u>**DISSERTATION PHASE-II**</u>

SUBJECT CODE: MMW-451

YEAR/SEMESTER: 2ND/4TH.

COURSE OUTCOME:

CO1	Apply critical and creative thinking in the design of engineering projects, Plan and manage your time effectively as a team
CO2	Consider the business context and commercial positioning of designed devices or systems and apply knowledge of the 'real world' situations that a professional engineer can encounter
CO3	Use fundamental knowledge and skills in engineering and apply it effectively on a project and design and develop a functional product prototype while working in a team
CO4	Undertake an engineering project under mentorship and timely reflect on your own and peers' technical and non-technical learning
CO5	Orally present and demonstrate your product to peers, academics, general and industry community and Manage any disputes and conflicts within and outside your team.