

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.)

A Govt. Added UGC Autonomous and NAAC Accredited Institute, Affiliated to R.G.P.V, Bhopal

## DEPARTMENT OF ELECTRONICS ENGINEERING

### Multiple Mode Teaching Learning Pattern

| Name of Course with Code:<br>Consumer Electronics<br>-9900207 |        | Class: B. Tech. IV Year  | Session: July Dec- 2023 |   |
|---|--------|--|-------------------------|---|
| S. No.  | Unit   | Content to be Covered  | Teaching Session        | Mode  |
| 1.  | Unit 1 | Basic Concept of Sound and Wave  | 1                       | Offline & Open discussions  |
| 2.  |        | Working Concept of Microphone  | 2-3                     | Offline & Open discussions  |
| 3.  |        | Concept of Carbon and Crystal Microphone   | 4-5                     | Offline & problem solving based learning                          |
| 4.  |        | Concept of Moving coil microphone  | 6-7                     | Offline & problem solving based learning                          |
| 5.  |        | Introduction to woofers and it's operation and Hi-Fi system                      | 8-9                     | Offline & problem solving based learning                          |
| 6.  | Unit 2 | Fundamental of Television system and scanning process                            | 10                      | Online & Open discussions   |
| 7.  |        | Concept of persistence of vision and flicker, vertical and horizontal resolution | 11-12                   | Online & problem solving based learning                           |
| 8.  |        | Fundamental of LCD and Plasma display  | 13-14                   | Offline & problem solving based learning                          |
| 9.  |        | Fundamental of LED TV technology   | 15                      | Offline & problem solving based learning                          |
| 10.   | Unit 3 | Basic working principle of Telecommunication systems                             | 16                      | Online & demonstration based learning                             |
| 11.   |        | Working principle of Modulation techniques: Analog and digital methods           | 17-19                   | Offline & Experiment with problem solving in group based learning |
| 12.   |        | Fundamental concept of Radio system and telephone receiver                       | 20-22                   | Offline & demonstration based learning                            |
| 14.   |        | Working principle of Cellular Communications                                     | 23                      | Offline & activity based learning                                 |
| 15.   |        | Types and operation of Transmitting and Receiving Antenna                        | 24-25                   | Offline & activity based learning                                 |

|     |        |  |       |   |
|-----|--------|--|-------|---|
| 16. | Unit 4 | Introduction to Digital Cellular Phone, Types of Mobile Phones and Cellular Systems. | 26-29 | Offline & Experiment with problem solving in group based learning |
| 18. | Unit 5 | Working principle of Microwave oven  | 30-31 | Offline & Open discussions  |
| 19. |        | Fundamental of Wave Guides and Magnetrons  | 32-33 | Offline & Onsite/ field visit                                     |
| 20. |        | Working principle of Air conditioning system and its types                           | 34-35 | Offline & Onsite/ field visit                                     |

| Online | Offline              |                      |                           |                                |                                  |                         |                             |
|--------|----------------------|----------------------|---------------------------|--------------------------------|----------------------------------|-------------------------|-----------------------------|
|        | Black Board Teaching | Group based Learning | Learning through projects | Learning through demonstration | Learning through experimentation | Activity based Learning | Onsite/field based learning |
| 11.42% | 69.58%               | 17.14%               | 13.95%                    | 8.5%                           | 11.42%                           | 13.95%                  | 11.42%                      |

*Madhav*

Prof. Madhav Singh

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## DEPARTMENT OF ELECTRONICS ENGINEERING

### Multiple Mode Teaching Learning Pattern

| Name of Course with Code:<br>Satellite & Radar<br>Communication<br>(140711/200711) |        | Class: B. Tech. IY Year  |                  | Session: July –Dec. 2023  |  |
|--|--------|--|------------------|---|--|
| S. No.   | Unit   | Content to be Covered  | Teaching Session | Mode  |  |
| 1.   | Unit 1 | Introduction to Satellite Communication,   | 1                | Offline & Open discussions  |  |
| 2.   |        | Origin and History of Satellite Communication                                    | 2                | Offline & Open discussions  |  |
| 3.   |        | Current State of Satellite Communication   | 3                | Offline & activity based learning                                 |  |
| 4.   |        | Orbital Aspect of Satellite Communication , Orbital Mechanism, Equation of Orbit | 4-5              | Offline & Experiment with problem solving in group based learning |  |
| 5.   |        | Locating Satellite in Orbit , Orbital Elements                                   | 6                | Online & demonstration based learning                             |  |
| 6.   |        | Orbital Perturbation , Frequency Allocations and Applications                    | 7                | Offline & Open discussions  |  |
| 7.   | Unit 2 | Altitude and Orbit Control System  | 8                | Offline & problem solving based learning                          |  |
| 8.   |        | Telemetry Tracking and Command Power System, Communication Sub System            | 9                | Offline & problem solving based learning                          |  |
| 9.   |        | Earth Station Design , Antenna Tracking  | 10               | Offline & problem solving based learning                          |  |
| 10.  |        | LNA  | 11               | Online & demonstration based learning                             |  |
| 11.  |        | HPA,RF   | 12               | Offline & problem solving based learning                          |  |
| 12.  |        | Multiplexing Factor Affecting Orbit Utilization                                  | 13,14            | Offline & problem solving based learning                          |  |
| 13.  |        | Tracking, Equipment for Earth Station.   | 15,16            | Offline & Experiment with problem solving in group based learning |  |
| 14.  | Unit 3 | Satellite Link Design  | 17               | Offline & Open discussions  |  |
| 15.  |        | System Noise Temperature and G/T Ratio   | 18               | Offline & Open discussions  |  |
| 16.  |        | Downlink Design  | 19               | Offline & Open discussions  |  |
| 17.  |        | Domestic Satellite System, Uplink Design   | 20               | Online & demonstration based learning                             |  |

|     |                                   |   |                      |   |                                   |
|-----|-----------------------------------|---|----------------------|---|-----------------------------------|
| 18. |                                   | Earth Path Propagation Effect                     | 21-22                | Offline & problem solving based learning                          |                                   |
| 19. |                                   | Losses in Link Design.                            |                      |   |                                   |
| 20. | Unit 4                            | Principles of RADAR, Radar Frequencies            | 23                   | Offline & Open discussions  |                                   |
| 21. |                                   | Pulse RADAR, RADAR Range Equation                 | 24                   | Online & demonstration based learning                             |                                   |
| 22. |                                   | RADAR Application                                 | 25-26                | Online & demonstration based learning                             |                                   |
| 23. |                                   | RADAR Cross Section of Targets<br>RADAR Indicator | 27                   | Offline & Open discussions  |                                   |
| 24. |                                   | Noise Figure of Receiver                          | 28                   | Online & demonstration based learning                             |                                   |
| 25. |                                   | Mixer Duplexer, Line Pulsar.                      | 29                   | Online & demonstration based learning                             |                                   |
| 26. |                                   | Unit 5  | MTI RADAR            | 30  | Offline & Open discussions        |
| 27. |                                   |   | Delay Line Cancellor | 31  | Offline & activity based learning |
| 28. | Digital Signal Processing         |   | 32                   | Online & demonstration based learning                             |                                   |
| 29. | Limitation of MTI RADAR, CW RADAR |   | 33-34                | Offline & Experiment with problem solving in group based learning |                                   |
| 30. | FM CW RADAR                       |   | 35                   | Offline & Open discussions  |                                   |

| Online | Offline              |                      |                           |                                |                                  |                         |                             |
|--------|----------------------|----------------------|---------------------------|--------------------------------|----------------------------------|-------------------------|-----------------------------|
|        | Black Board Teaching | Group based Learning | Learning through projects | Learning through demonstration | Learning through experimentation | Activity based Learning | Onsite/field based learning |
| 22%    | 28.57%               | 8.57%                | 00%                       | 22%                            | 8.57%                            | 5.714%                  | 00%                         |



Dr. R. P. Narwaria

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### Multiple Mode Teaching Learning Pattern

| Name of Course with Code:<br>Satellite Systems (910216) |        | Class: B. Tech. VII<br>Year   | Session: July-December2023 |   |
|---|--------|---|----------------------------|---|
| S. No.  | Unit   | Content to be Covered   | Teaching Session           | Mode  |
| 1.  | Unit 1 | Introduction of Satellite Communication, Origin, history and current state              | 1                          | Offline & activity based learning                                 |
| 2.  |        | Orbital Aspect of Satellite Communication , Orbital Mechanism                           | 2                          | Offline & Open discussions  |
| 3.  |        | Equation of Orbit, Locating Satellite in Orbit  | 3-4                        | Offline & Experiment with problem solving in group based learning |
| 4.  |        | Orbital Elements  | 5                          | Online & demonstration based learning                             |
| 5.  |        | Orbital Perturbation.   | 6                          | Offline & Open discussions  |
| 6.  | Unit 2 | Introduction to Space Craft Sub System and Earth Station                                | 7                          | Offline & problem solving based learning                          |
| 7.  |        | Altitude and Orbit Control System,  | 8                          | Offline & problem solving based learning                          |
| 8.  |        | Telemetry Tracking and Command Power System   | 9                          | Offline & problem solving based learning                          |
| 9.  |        | Communication Sub System, Earth Station Design,   | 10                         | Online & demonstration based learning                             |
| 10.   |        | Antenna Tracking, LNA, HPA,RF,  | 11                         | Offline & problem solving based learning                          |
| 11.   |        | Multiplexing Factor Affecting Orbit Utilization,  | 12                         | Offline & problem solving based learning                          |
| 12.   |        | Tracking, Equipment for Earth Station, Frequency Allocation in Satellite Communication. | 13-14                      | Offline & Experiment with problem solving in group based learning |
| 13.   | Unit 3 | Introduction to Indian Satellite Launch Vehicle   | 15                         | Offline& Onsite/ field visit based Learning                       |
| 14.   |        | SLV (Satellite Launch Vehicle), ASLV (Augmented Satellite Launch Vehicle),              | 16                         | Offline& Onsite/ field visit based Learning                       |
| 15.   |        | PSLV (Polar Satellite Launch Vehicle),  | 17                         | Offline & Open discussions  |
| 16.   |        | GSLV (Geosynchronous Satellite Launch Vehicle),   | 18                         | Online & demonstration based learning                             |
| 17.   |        | GSLV Mk III, Sounding Rockets.  | 19-20                      | Offline & Onsite/ field visit based Learning                      |

|     |               |   |       |   |
|-----|---------------|---|-------|---|
| 18. | <b>Unit 4</b> | Introduction to Satellite Link Design                       | 21    | Offline & Open discussions  |
| 19. |               | System Noise Temperature                                    | 22-23 | Online & demonstration based learning                             |
| 20. |               | G/T Ratio   | 23-24 | Online & demonstration based learning                             |
| 21. |               | Downlink Design   | 25-26 | Offline & Open discussions  |
| 22. |               | Domestic Satellite System,                                  | 27-28 | Online & demonstration based learning                             |
| 23. |               | Uplink Design   | 29-30 | Online & demonstration based learning                             |
| 24. | <b>Unit 5</b> | Introduction to Indian Regional Navigation Satellite System | 31    | Offline & Open discussions  |
| 25. |               | IRNSS System Overview                                       | 32    | Offline & activity based learning                                 |
| 26. |               | IRNSS Signal Characteristics                                | 33    | Online & demonstration based learning                             |
| 27. |               | IRNSS Data Structure, Sub Frame Structure.                  | 34-35 | Offline & Experiment with problem solving in group based learning |

| Online | Offline              |                      |                           |                                |                                  |                         |                             |
|--------|----------------------|----------------------|---------------------------|--------------------------------|----------------------------------|-------------------------|-----------------------------|
|        | Black Board Teaching | Group based Learning | Learning through projects | Learning through demonstration | Learning through experimentation | Activity based Learning | Onsite/field based learning |
| 20.93% | 69.77%               | 37.21%               | 13.95%                    | 27.90%                         | 48.84. %                         | 13.95%                  | 9.30%                       |

Dr. Karuna Markam