**Bharati Vidyapeeth’s College of Engineering For Women, Pune-Satara Road,** **Pune-411 043**

**Academic Audit Committee Report (Faculty)**

**Name of the Dept.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Academic Year: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Semester: \_\_\_\_\_\_\_\_\_\_\_\_**

**Date of Academic Audit visit: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Sr. No.** | **Name of the Staff member** | **Course File**  | **Academic Record Book** | **Personal File** | **Signature of the Staff** |
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| **Sr. No.** | **Course File** |
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| 01 | Syllabus (University Syllabus Structure, Course Objectives, Course Outcomes and Course Attainment Methods) |
| 02 | Notes-PPTS/Transparencies/Hand written/e books/etc  |
| 03 | Beyond Syllabus (Syllabus gaps) |
| 04 | Lab Experiments/Assignment (Curriculum and Beyond Curriculum)  |
| 05 | Results (Theory & Practical) (Last two years University and institute result for the course. UT/Prelim/Mock OR/Mock PR/MCQ Results) |
| 06 | Unit Test/Prelim question papers with solutions and Sample Answer Sheets  |
| 07 | University Question Papers and Model Answers  |
| 08 | Unit wise Question bank (Theory, Practical/Assignment/Experiment/Tutorial wise oral question bank, MCQs bank for online examination) |
| 09 | Feedback (Course and General Faculty Feedback) |
| 10 | GATE/IES etc syllabus related to subjects taught  |
| 11 | Action Plans (Compensatory/Remedial classes/Expert lecture/ Guest Lecture) |
| 12 | CO-PO Attainment  |

 **Subject Teacher**

**Documents to be presented along with Course File:**

1. Attendance Record Book (signed by HOD)
2. Sample Journals
3. Sample Assignments
4. Unit Test/ Prelim sample answer sheets

**Personal File**

**INDEX**

1. BCUD Teacher Profile
2. Curriculum Vitae
3. Mark Sheets and Passing Certificates
4. University Approvals ( UG & PG )
5. Experience Certificates
6. Paper Publications Details
7. Participation Certificates

 ( FDP, Seminars, Refresher course, Workshops etc.)

1. Contribution as a Resource Person in SPPU
2. Students Feedback
3. SPPU University Examination Work Orders
4. CAP Assessment Certificates
5. Project Guided at UG/PG/Ph. D level

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| **Sr. No.** | **GFM File Contents** |
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| 01 | Roll Call List |
| 02 | Class Time Table |
| 03 | Student Registration forms  |
| 04 | Student Counselors list  |
| 05 | Batch Coordinators list  |
| 06 | Class Representative Name and details |
| 07 | List of Student In charges for various activities. |
| 08 | Syllabus and Practical coverage details monthly |
| 09 | Student leave applications |
| 10 | Students T&P related activity attendance record ( only applicable to TE & BE) |
| 11 | Monthly attendance record (Theory and Practical) |
| 12 | Monthly defaulter list, Final defaulter list |
| 13 | Parents meeting record in case of defaulter |
| 14 | Receipt of Letter sent to defaulter students’ parents  |
| 15 | Test and Prelim record |
| 16 | Remedial action record |
| 17 | Any other |

**Name of the GFM and signature HOD**



**Bharati Vidyapeeth’s College of Engineering for Women**

**Dhankawadi, Pune-411043**

**GFM FILE**

**BE E&TC (DIV II)**

PROF. DR. S. S. CHORAGE

Department of

Electronics & Telecommunication Engineering

SEMESTER II 2016-17



**Bharati Vidyapeeth’s College of Engineering for Women**

**Dhankawadi, Pune-411043**

**COURSE FILE**

BE E&TC

**MICROWAVE ENGINEERING**

PROF. DR. S. S. CHORAGE

Department of

Electronics & Telecommunication Engineering

2016-17

**Syllabus**

**(University Syllabus Structure, Course Objectives, Course Outcomes and Course Attainment Methods)**

**TEACHING METHODOLOGY**

**404183: Microwave Engineering**

**Teaching Scheme: Examination Scheme:**

**Lectures: 4Hrs/Week In Semester Assessment: Phase I: 30**

 **End Semester Examination: Phase II: 70**

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| --- | --- | --- | --- |
| Unit | Topics & Subtopics | Page No’s | Topic wise References |
| Unit I | Transmission Lines and Waveguides Introduction to Microwaves engineering: History of Microwaves, Microwave Frequency bands. Applications of Microwave.  | 1-61-8 | T2R1 |
| General solution for TEM, TE and TM waves, Parallel plate waveguide, and rectangular waveguide. Wave guide parameters.  | 95-121103-117 | T2T1 |
| Introduction tocoaxial line, Rectangular waveguide cavity resonators, Circular waveguide cavity resonators. (No derivations) | 130-135 284-293 135-141 | T2T1 |
| Unit II | Microwave Components Multi-port junctions: Construction and operation of E-plane, H-plane, Magic Tee and Directional couplers. | 141-154 317-324 186-208 | T1 T2 R1 |
| Ferrites components: - Ferrite Composition and characteristics, Faraday rotation, Construction and operation of Gyrator, Isolator and Circulator. | 465-467475-493 | T2 |
| Striplines: Structural details and applications of Strip lines, Microstrip line, Parallel Strip line, Coplanar Strip line, Shielded Strip Line.(No derivations) | 141-149 473-491 | T2 T1 |
| Unit III | Microwave Network Analysis Introduction and applications of Impedance and Equivalent voltages and currents, Impedance and Admittance matrices, The Transmission (ABCD) matrix | 165-194 | T2 |
| Scattering Matrix:-Significance, formulation and properties. S-Matrix calculations for-2 port network junction, E plane, H-plane and E-H (Magic Tee) Tees, Directional coupler, Isolator and Circulator. Related problems. | 317-324 144-161  | T2 T1 |
| Unit IV | Microwave Tubes Limitations of conventional tubes, O and M type classification of microwave tubes, reentrant cavity, and velocity modulation. O type tubes Two cavity Klystron: Construction and principle of operation, velocity modulation and bunching process Applegate diagram. Reflex Klystron: Construction and principle of operation, velocity modulation and bunching process, Applegate diagram, Oscillating modes, o/p characteristics, efficiency, electronic & mechanical tuning. | 335-382282-289292-313 | T1R1 |
| M-type tubes :Magnetron: Construction and Principle of operation of 8 cavity cylindrical travelling wave magnetron, hull cutoff condition, modes of resonance, PI mode operation, o/p characteristics, Applications. | 425-436324-325 | T1R1 |
| Slow wave devices : Advantages of slow wave devices, Helix TWT: Construction and principle of operation, Applications. |  382-398 313-315 | T1 R1 |
| Unit V  | Microwave Solid State Devices :Microwave bipolar transistor, FET, MESFET, Varactor Diode, PIN Diode, Shottky Barrier Diode, Tunnel Diode, TEDs, Gunn Diodes, IMPATT diode and TRAPATT diode. Structural details, Principle of operation, various modes, specifications, and applications of all these devices. | 166-192 198-204 208-226 269-291 309-317 352-403 | T1R1 |
| Unit VI | Microwave Measurements Measurement devices: Slotted line, Tunable detector, VSWR meter, Power Meter, S-parameter measurement, frequency measurements, Power measurement, Attenuation measurement, Phase shift measurement, VSWR measurement, Impedance measurement, Q of cavity resonator measurement. | 247-282 12-44 98-105 | R1 R3 |

Text Books:

T1. Samuel Y. Liao, “Microwave Devices and Circuits”, 3rd edition, Pearson

T2. David M. Pozar, “Microwave Engineering", Fourth edition, Wiley.

Reference Books:

R1. M. Kulkarni, “Microwave and Radar engineering”, 3rd edition, Umesh Publications

R2. M L Sisodia& G S Raghuvamshi, “Microwave Circuits and Passive Devices”Wiley, 1987

R3. M L Sisodia& G S Raghuvanshi, “Basic Microwave Techniques and Laboratory Manual”, New Age International (P) Limited, Publishers

**Bharati Vidyapeeth’s College of Engineering For Women, Pune-Satara Road,** **Pune-411 043**

**Academic Audit Committee Report (Laboratory)**

**Name of the Dept.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Academic Year: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Semester: \_\_\_\_\_\_\_\_\_\_\_\_**

**Date of Academic Audit visit: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Sr. No.**  | **Name of the Lab** | **Name of the Lab In charge** | **Name of the Lab Assistant** | **Lab attendance Register status****Maintained / Not Maintained/ Not in place** |
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**Suggestions by the verifying committee members:**

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**Checked By (signature with date): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Submitted to:**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **Bharati Vidyapeeth’s College of Engineering For Women, Pune-Satara Road,** **Pune-411 043**

**Academic Audit Committee Report (Final)**

**Name of the Dept.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Academic Year: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Semester: \_\_\_\_\_\_\_\_\_\_\_\_**

**Date of Academic Audit visit: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Sr. No.**  | **Activity Conducted** | **Remarks** |
| **1** | Verification of lab attendance registers. |  |
| **2** | Checking of Course files and Cos. |  |
| **3** | Checking of Personal File. |  |
| **4** | Checking of Attendance Record Book. |  |
| **5** | Conducting meeting of all GFMs. |  |
| **6** | Checking of GFM file |  |
| **7** | Conducting meeting of subject mentors. |  |
| **8** | Verification of result analysis. |  |
| **9** | Verification of Defaulter list. |  |
| **10** | Verification of Student counselor meeting record. |  |
| **11** | Verification of Mid-term submission and continuous assessment. |  |
| **12** | Verification of conduction of Unit test and prelim exam and its assessment records |  |
| **13** | Verification of conduction of Mock Practical exam and its assessment records |  |

**Enclosures submitted:**

1. **Academic Audit Committee Report (Faculty)**
2. **Academic Audit Committee Report (Laboratory)**
3. **Academic Audit Committee Report (Final)**
4. **Library Verification Report**
5. **List of Subject Mentors department wise**
6. **List of student counselors department wise**

**Suggestions by the verifying committee members:**

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**Checked By (Coordinator signature with date): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Submitted to: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Bharati Vidyapeeth's College of Engineering for Women,Pune-43** |
|  **Department of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Class Time Table Academic Year \_\_\_\_\_\_\_\_\_\_\_\_ Semester \_\_\_\_\_\_\_\_\_Day: \_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_ |
| **Class \_\_\_\_\_\_** |
| **Time/Day** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** | **Saturday** |
| 9:00 - 10:00 |  |  |  |  |  |  |
| 10:00 - 11:00 |  |  |  |  |  |  |
| 11:00 - 11:15 | Short Break |
| 11:15 - 12:15 |  |  |  |  |  |  |
| 12:15 - 1:15 |  |  |  |  |  |  |
| 1:15 - 2:00 | Long Break |
| 2:00 - 3:00 |   |  |  |  |  |  |
| 3:00- 4:00 |   |  |  |  |  |  |

**Academic Monitoring Committee Member Name and Sign. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**HOD Name and Sign. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**