**University of Management and Technology**

**Course Outline**

Course code……EE 208………………… Course title……Electronic Devices & Circuits……………………

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| Program | BSEE |
| Credit Hours | 3 |
| Duration | One semester |
| Prerequisites | EE-111 Circuit Analysis |
| Resource Person | M.Shoaib, Waseem Iqbal & Zawar Hussain |
| Counseling Timing | See office window |
| Contact | Muhammad.shoaib@umt.edu.pk, waseem.iqbal@umt.edu.pk and  Zawar.hussain@umt.edu.pk |

**Chairman/Director signature………………………………….**

**Dean’s signature…………………………… Date………………………………………….**

**Learning Objective:**

Upon Completion of the course, the students will be able to:-

1. Understand distinguishing characteristics of BJTs, MOSFETS ans CMOS
2. Understand basic electronic devices e.g., diode, transistor construction and characteristics
3. DC biasing of transistors
4. DC biasing of FETs
5. solve simple circuits using diodes, transistors , MOSFETS & CMOS
6. load line analysis of diode, transistors and MOSFETS
7. solving problems related to amplification using transistors and MOSFETS.
8. working of a transistor and MOSFET as a switch for digital circuits
9. Able to design electronic circuits to meet given specs

**Learning Methodology:**

Lecture, interactive, participative

**Grade Evaluation Criteria**

Following is the criteria for the distribution of marks to evaluate final grade in a semester.

**Marks Evaluation Marks in percentage**

Quizzes 15

Mid Term 25

Term Project 10

Final exam 50

Total 100

**Recommended Text Books:**

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**Text book:** Electronics Devices and Circuit Theory by Robert L. Boylestad/LNashelsky ,Tenth edition

**Reference Books:**

1) Electronic Devices by Thomas L Floyd. Ninth edition

2) Microelectronics Circuits by Sedra/Smith. Fifth edition

3) Electronics Devices and Circuit Prentice Hall, by Guillermo Rico, Jeffrey , Bogart) Sixth edition

**Calendar of Course contents to be covered during semester**

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| --- | --- | --- |
| **Week** | **Course Contents** | **Textbook (topics)** |
| 1 | Introduction to electronic devices and circuits, Semiconductor materials | TB : 1.1-1.5 |
| 2 | Semiconductor Diode, Ideal versus practical  Resistance Levels, Diode Equivalent circuits | TB: 1.6-1.9 |
| 3 | Transition and diffusion capacitance, reverse recovery time, diode specification sheets, diode notation, diode testing  Zener Diodes, LEDs | TB: 1.10-1.16 |
| 4 | Introduction, Load line analysis of diode, diode series parallel configurations, AND/OR gates and Sinusoidal Inputs: Half /Full wave rectification | TB: 2.1-2.7 |
| 5 | Clamper Circuits  Clipper circuits | TB: 2.8-2.9 |
| 6 | AC plus DC analysis of diode circuits (superposition principle)  Zener diode (as a regulator) | TB: 2.10-2.11 |
| 7 | BJT, construction, Operation, Common Base Configuration, transistor amplifying action, Common Emitter configurations, Common Collector Configurations, Limits of operations, transistor specification sheets, transistor testing | TB: 3.1-3.10 |
| 8 | **Mid Term Examination** |  |
| 9 | Introduction, operating point, fixed biased configuration, emitter biased configuration, voltage divider biased configuration, collector feedback configuration, emitter follower configuration, common base configuration | TB: 4.1-4.8 |

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| 10 | Miscellaneous Bias configurations, Design Operations, Transistor switching networks, | TB: 4.9, 4.11, 4.16 |
| 11 | BJT AC analysis, BJT transistor Modeling, The re transistor model for common base and common emitter configurations, Common Emitter fixed bias configurations, Voltage divider bias | TB: 5.1-5.6 |
| 12 | CE Emitter-Bias configurations, Emitter follower Configuration, Collector feedback ,collector dc feedback configuration, Cascaded systems, Hybrid model | TB: 5.7-5.11, 5.16, 5.19, 5.22 |
| 13 | Introduction, construction and characteristics of JFETs, transfer characteristics, important relationships, depletion and enhancement type MOSFET, CMOS | TB: 6.1-6.3, 6.6-6.8 and 6.11 |
| 14 | Introduction, fixed biased configuration, self biased configuration, voltage divider biased configuration, common gate configuration, special case | TB: 7.1-7.6 |
| 15 | Depletion type MOSFETs, Enhancement type MOSFETs | TB: 7.7-7.8 |