

University of Computer Studies, Yangon
B.C.Sc./B.C.Tech.

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| CT-304 | : Electronics II | Second Semester |
| Text book | : Electronic Devices (9th Edition) | |
| Period | : 45 periods for 15 weeks (4 periods/week) | |

Course Description

This course is intended to provide basic knowledge and understanding of small and large signal models; Field-Effect Transistor (FET), types of FET, theory and operation of FETs and MOSFETs, biasing techniques and characteristics, common-drain configuration, common-source configuration, common-gate configuration, fixed bias and self-bias configurations, voltage divider biasing, JFET and MOSFET bias curves, DC and AC analyses of FET; Introduction to operational amplifier; Basics of digital electronics. The student should develop the skill for solving problems on basic electronic circuits and develop the ability to analyze electronic systems using acquired basics.

Course Objectives

To expose students to the function and application of the Field-Effect Transistor (FET), types of FET, theory and operation of FETs and MOSFETs Circuits and hence to equip them with the necessary skills to practically implement application oriented and need based electronic circuits.

Assessment Plan for the Course

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|-------------|-----|
| Paper Exam: | 60% |
| Attendance: | 10% |
| Test/ Quiz: | 10% |
| Lab: | 10% |
| Project : | 10% |

Tentative Lecture Plan

| No. | Chapter | Page | Period | Detail Lecture Plan |
|------------|---|-------------|---------------|----------------------------|
| | Chapter 8 Field-Effect Transistors and Biasing | 384-450 | 10 | All Examples and Exercises |

| No. | Chapter | Page | Period | Detail Lecture Plan |
|-----|---|--------------------|-----------|--------------------------------------|
| 1. | 8-1 The Junction Field-Effect Transistor (JFET) | 384-387 | 1 | Review |
| 2. | 8-2 JFET Characteristics and Parameters | 387-397 | 3 | E.g. 8-1, 2, 3, 4, 5 |
| 3. | 8-3 JFET Biasing | 397-408 | 2 | E.g. 8-6,7, 8, 9, 10, 11, 12, 13 |
| 4. | 8-4 The Metal Oxide Semiconductor FET (MOSFET) | 408-412 | 1 | Review |
| 5. | 8-5 The MOSFET | 412-417 | 1 | E.g. 8-14, 15 |
| 6. | 8-6 MOSFET Characteristics and Parameters | 417-420 | 1 | E.g. 8-16, 17 |
| 7. | 8-7 MOSFET Biasing | 420-423 | 1 | E.g. 8-18, 19, 20 |
| | Chapter 9 FET Amplifier and Switching Circuits | 450-504 | 7 | All Examples and Exercises |
| 8. | 9-1 The Common-Source Amplifier | 450-464 | 3 | E.g. 9-1, 2, 4, 5, 6, 7, 8 |
| 9. | 9-2 The Common-Drain Amplifiers | 464-466 | 2 | E.g. 9-9 |
| 10. | 9-3 The Common-Gate Amplifiers | 467-470 | 2 | E.g. 9-10, 11 |
| 11. | Chapter 11 Thyristors | 564-601 | 4 | |
| 12. | 11-1 The Four-Layer Doide 11-2 The Silicon-Controlled Rectifier (SCR) | 565-568 568-572 | 1 | E.g. 11-1,2 Related Exercises |
| 13. | 11-3 SCR Applications | 573-577 | 1 | E.g. 11-3, 4 Related Exercises |
| 14. | 11-4 The Diac and Triac 11-5The Silicon-Controlled Switch (SCS) | 578-582 582-583 | 1 | Related Exercises |
| 15. | 11-6 The Unijunction Transistor (UJT) 11-7 The Programmable Unijunction Transistor (PUT) | 583-588 588-589 | 1 | E.g. 11-6 Related Exercises |
| | Chapter 12 Operational Amplifier | 602-666 | 10 | |
| 16. | 12-1 Introduction to Operational Amplifiers | 603-605 | 2 | |
| 17. | 12-2 Op-Amp Input Modes and Parameters | 605-613 | 2 | E.g. 12-1, 2 |
| 18. | 12-3 Negative Feedback 12-4 Op-Amp with Negative Feedback | 613-614 614-619 | 2 | E.g. 12-3, 4 Related Exercises |
| 19. | 12-5 Effects of Negative Feedback on Op-Amp Impedances | 619-624 | 1 | E.g. 12-5, 6, 7 Related Exercises |
| 20. | 12-6 Bias Current and Offset Voltage | 624-627 | 1 | Related Exercises |

| No. | Chapter | Page | Period | Detail Lecture Plan |
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| 21. | 12-7 Open-Loop Frequency and Phase Responses | 627-633 | 1 | E.g. 12-8, 9, 10 Related Exercises |
| 22. | 12-8 Closed-Loop Frequency Response | 633-636 | 1 | E.g. 12-11, 12 Related Exercises |
| | Chapter 13 Basic Op-Amp Circuits | 667-717 | 6 | |
| 23. | 13-1 Comparators | 668-679 | 2 | E.g. 13-1,2, 3, 4 Related Exercises |
| 24. | 13-2 Summing Amplifiers | 679-687 | 2 | E.g. 13-5, 6, 7, 8, 9 Related Exercises |
| 25. | 13-3 Integrators and Differentiators | 687-693 | 2 | E.g. 13-10, 11 Related Exercises |
| | Chapter 15 Active Filters | 764-805 | 6 | All Examples and Exercises |
| 26. | 15-1 Basic Filter Responses | 764-768 | 1 | |
| 27. | 15-2 Filter Response Characteristics | 768-772 | 1 | |
| 28. | 15-3 Active Low-Pass Filters | 772-776 | 1 | |
| 29. | 15-4 Active High-Pass Filters | 776-779 | 1 | |
| 30. | 15-5 Active Band-Pass Filters | 779-784 | 1 | |
| 31. | 15-6 Active Band-Stop Filters | 785-786 | 1 | |
| 32. | Revision | | 2 | All Chapters |

| No. | Lab | Period (15) | Description |
|-----|---------------|-------------|-----------------------|
| 1. | Lab 8 | 2 | Transistors Testing |
| 2. | Lab 9 | 2 | Operational Amplifier |
| 3. | Lab 10 | 2 | Op-Amp Applications |
| 4. | Lab (Project) | 9 | |