Philadelphia University
Faculty of Engineering
Department of Communications & Electronics

Course Syllabus

Course Title: Electronics(1)	Course code: 650221 ,650222
Course Level: 2nd year	Course prerequisite (s) and/or corequisite (s): Electrical Circuits (610211)
Lecture Time:	Credit hours: 3 Tutorial: 1 hour/Week

Academic Staff Specifics

Name	Rank	Office Location	Office Hours	E-mail Address

Course module description:

This course aims to provide students with all information about:

Semiconductor Diode Circuit Analysis:
Semiconductor Diodes ,Rectification ,Zener Diodes ,Clipper ,Clampers
Bipolar Junction Transistors (BJT) : Transistor Models, Bipolar Transistor Biasing ,Common Emitter Amplifier (CE), Common Collector Amplifier (CC) ,Common Base Amplifier (CB)

Design of Bipolar Junction Transistor Amplifier (CE,CC,CB):
Input Resistance ,Current Gain ,Voltage Gain ,Output Resistance
Junction Field Effect Transistors (JFET): Types of FETs , operation and Construction,
MOSFET Operation and Construction
Field Effect Transistor (JFET & MOSFET) Amplifier:
Biasing of FETs ,Analysis and Design of Common Source (CS) and Common Drain (CD) Amplifiers

Course module objectives:

At completing this course the student should be able to:

- Know the operation and the structure of the electronics devices like diodes, bipolar transistor and field effect transistors.
- Design rectifier circuit, clipping and clamping circuits.
- Design and analysis of different types of amplifiers.
- Have an idea about the Operational Amplifier and its applications.

Course/ module components:

- **Books (title , author (s), publisher, year of publication)**

  Title: Electronic Design, Circuits and Systems.
  Author: Savanat, Roden & carpenter.
  Publisher: Latest edition, 2007

- **Support material (s) (vcs, acs, etc).**
- **Study guide (s) (if applicable)**
- **Homework and laboratory guide (s) if (applicable).**

Teaching methods:

Lectures, discussion in class, tutorials, and problem solving.
Duration: 16 weeks, 48 hours in total
Lectures: 48 hours, 3 per week + two exams (two hours)

Learning Outcomes:

A) Knowledge and understanding Skills:

Students will obtain knowledge and understanding of:

1) The structure of different communication systems.
2) The way of thinking and how to design.
3) The methods of developing the communication systems.
4) How to build, as hardware, different communication systems.

B) Intellectual Skills:

The students will acquire and develop the thinking skills that should enable them to:

1) Apply appropriate techniques to the transmission systems that are currently used for data, voice and video over LAN and WAN broadband networks.
2) Analyze and identify the specifications and tools to design typical process control applications, applicable to data communications and its related electronics systems.

C) Practical Skills:

Students will acquire and develop the practical skills that should allow them to:

1) Use appropriate numerical and mathematical skills to describe, analyze and solve a problem in electronics or/and communication system.
2) Use various laboratory equipment as diagnostic tool to detect a faults and identify a problem in electronics or/and communication system.
3) Analyze, design, evaluate, system behavior and test electronic or/and communication system using simulation or computer-based tool (engineering software tool).
4) Implement electronic circuits for communication system.

D) Practical and subject specific skills (Transferable Skills):

Students will acquire and develop the key transferable skills that will enable them to:

1) Work with a wide variety of people.
2) Manage tasks, and solve problems.
3) Think logically and critically.

Assessment instruments

- Short reports and/ or presentations, and/ or Short research projects
- Quizzes.
- Home works
- Final examination: 50 marks

Allocation of Marks	
Assessment Instruments	Mark
First examination	15%
Second examination	15%
Final examination: 50 marks	50%
Reports, research projects, Quizzes, Home works, Projects	20%
Total	100%

** Make-up exams will be offered for valid reasons only with consent of the Dean. Make-up exams may be different from regular exams in content*

Documentation and Academic Honesty

Submit your home work covered with a sheet containing your name, number, course title and number, and type and number of the home work (e.g. tutorial, assignment, and project).

Any completed homework must be handed in to my office (room 813) by 13:00 on the due date. After the deadline "zero" will be awarded. You must keep a duplicate copy of your work because it may be needed while the original is being marked.

You should hand in with your assignments:

1- A printed listing of your test programs (if any).
2- A brief report to explain your findings.
3- Your solution of questions.

For the research report, you are required to write a report similar to a research paper. It should include:

- Abstract: It describes the main synopsis of your paper.
- Introduction: It provides background information necessary to understand the research and getting readers interested in your subject. The introduction is where you put your problem in context and is likely where the bulk of your sources will appear.
- Methods (Algorithms and Implementation): Describe your methods here. Summarize the algorithms generally, highlight features relevant to your project, and refer readers to your references for further details.
- Results and Discussion (Benchmarking and Analysis): This section is the most important part of your paper. It is here that you demonstrate the work you have accomplished on this project and explain its significance. The quality of your analysis will impact your final grade more than any other component on the paper. You should therefore plan to spend the bulk of your project time not just gathering data, but determining what it ultimately means and deciding how best to showcase these findings.

- Conclusion: The conclusion should give your reader the points to "take home" from your paper. It should state clearly what your results demonstrate about the problem you were tackling in the paper. It should also generalize your findings, putting them into a useful context that can be built upon. All generalizations should be supported by your data, however; the discussion should prove these points, so that when the reader gets to the conclusion, the statements are logical and seem self-evident.
- Bibliography: Refer to any reference that you used in your assignment. Citations in the body of the paper should refer to a bibliography at the end of the paper.

• **Protection by Copyright**

1. Coursework, laboratory exercises, reports, and essays submitted for assessment must be your own work, unless in the case of group projects a joint effort is expected and is indicated as such.
2. Use of quotations or data from the work of others is entirely acceptable, and is often very valuable provided that the source of the quotation or data is given. Failure to provide a source or put quotation marks around material that is taken from elsewhere gives the appearance that the comments are ostensibly your own. When quoting word-for-word from the work of another person quotation marks or indenting (setting the quotation in from the margin) must be used and the source of the quoted material must be acknowledged.
3. Sources of quotations used should be listed in full in a bibliography at the end of your piece of work.

• **Avoiding Plagiarism.**

1. Unacknowledged direct copying from the work of another person, or the close paraphrasing of somebody else's work, is called plagiarism and is a serious offence, equated with cheating in examinations. This applies to copying both from other students' work and from published sources such as books, reports or journal articles.
2. Paraphrasing, when the original statement is still identifiable and has no acknowledgement, is plagiarism. A close paraphrase of another person's work must have an acknowledgement to the source. It is not acceptable for you to put together unacknowledged passages from the same or from different sources linking these together with a few words or sentences of your own and changing a few words from the original text: this is regarded as over-dependence on other sources, which is a form of plagiarism.
3. Direct quotations from an earlier piece of your own work, if not attributed, suggest that your work is original, when in fact it is not. The direct copying of one's own writings qualifies as plagiarism if the fact that the work has been or is to be presented elsewhere is not acknowledged.
4. Plagiarism is a serious offence and will always result in imposition of a penalty. In deciding upon the penalty the Department will take into account factors such as the year of study, the extent and proportion of the work that has been plagiarized, and the apparent intent of the student. The penalties that can be imposed range from a minimum of a zero mark for the work (without allowing resubmission) through caution to disciplinary measures (such as suspension or expulsion).

Course/module academic calendar

week	Basic and support material to be covered	Homework/reports and their due dates
(1)	Semiconductor Materials	
(2)	pn junction diodes circuits and models	

(3)	Zener diodes and rectification	Quiz 1
(4)	Other diodes applications	
(5)	Bipolar junction transistors (BJT)	
(6)	Circuits and models)	First exam
(7)	Transistor biasing	
(8)	Transistor configurations	Quiz. 2
(9)	Transistor amplifiers	
(10)	Junction field effect transistor (JFET)	Second Exam
(11)	Metal oxide semiconductor field effect transistor (MOSFET)	
(12)	Biasing FET & MOSFET	Quiz. 3
(13)	MOSFET Amplifiers	
(14)	Operational Amplifiers	
(15)	Operation & applications of OP AMP	
(16)		Final Examination

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Course references

Books

1. Adel &. Sedra and Kenneth C. Smith; Microelectronic circuits; 3rd Ed; Saunders College Pub.; 1991.
2. Jacob Milkman and Arvin Grabel; Microelectronics; 2nd Ed; McGraw - Hill Pub.; 1988.
3. Thomas L. floyed, Electronics Fundamentals; circuits, devices and applications, 8th edition.
4. Donald A. Neamen, Electronic Circuit Analysis and Design, 2nd edition, 2001, McGraw-Hill.
5. R. Boylestad**,** Electronic Devices and Circuit Theory, 8th edition, 2002, Prentice Hall

Analog system designers many times in the past avoided the use of electronics for their system functions because electronic circuits could not provide the dynamic range of the signal without severe nonlinearity, or because the circuits drifted or became unstable with temperature, or because the computations using analog signals were quite inaccurate. As a result, the design shifted to other disciplines, for example, mechanical.Â The new design technique requires that the electronic system designer interface between two distinct design worlds. First, between analog and digital systems, and second, between the external human world and the internal electronics world. Various functions are required to make the interface. Electronic Design book. Read reviews from worldâ€™s largest community for readers.Â Goodreads helps you keep track of books you want to read. Start by marking â€œElectronic Design: Circuits and Systemsâ€ as Want to Read: Want to Read savingâ€¦ Want to Read. Currently Reading. Read. Electronic Design: Cir by C.J. Savant. Other editions. Want to Read savingâ€¦ Error rating book. Refresh and try again. Rate this book. Clear rating. In these hybrid systems, design trade-offs often span the knowledge space of both mechanical and electrical engineering. For example, in a car engine, is it more cost-effective to design a precise mechanical timing mechanism to trigger the firing of each cylinder, or is it better to use electronic sensors to measure the positions of each piston and then use a microprocessor to trigger the firing?Â The following text is designed to provide an efficient introduction to electronic circuit design. The text is divided into two parts. Part I is a barebones introduction to basic electronic theory while Part II is designed to be a practical manual for designing and building working electronic circuits. Â© 2005 Hongshen Ma. 2.