

Zarqa University



**Prerequisite:** Electronics I (0904221) & Electrical circuits II (0904234)

Faculty of Engineering Technology

**Instructor:** TBD

Department: Electrical Engineering

**Lecture's time:** TBD

Course title: Electronics II (0904328)

**Office Hours:** TBD

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### Course description:

In this course the students will study amplifier configurations and characteristics modeling of transistor circuits. Frequency analysis of BJT and FET amplifiers. Multistage amplifiers. Frequency response of single-and-multi-stage amplifiers. The differential amplifier. Theory of Op-Amps. Applications of Op-Amps. Power amplifiers.

### Aims of the course:

1. Understand amplifier configurations, parameters, and transistor models.
2. Consider the operations and characteristics of BJT amplifier, differential amplifier, multistage amplifiers BJT and MOSFET.
3. Analyze multistage amplifiers.
4. Study frequency response of BJT and FET amplifiers.
5. Study power amplifiers classes (class A, Class B/AB push-pull and Darlington amplifiers).
6. Study the theory of Op-Amp and its applications.

### Intended Learning Outcomes (ILOs):

**A student who has passed this module should be able to:**

- 1- Determine, and explain the amplifier configurations and characteristics modeling of transistor circuits.
- 2- Illustrate BJT amplifier DC and AC equivalent circuits, and load lines.
- 3- Calculate the BJT parameters, input/output resistances, dissipation power ( $P_D$ ), currents, voltages, and gains.
- 4- Calculate the frequency responses of BJT and FET.
- 5- Design BJT biasing circuits, inverting and noninverting operational amplifiers, single stage and multistage amplifiers and power amplifier circuits (push pull and Darlington amplifiers).



**Course structures:**

Week (s)	C. Hrs	ILOs	Topics	Teaching Procedure	Assessment methods
1-2		1	Review and Deep Understanding of Bipolar Junction Transistors (BJTs).	Lecturing from the text and reference books	HWs
3-4		2 & 3	Transistor Bias Techniques and Circuits.	Lecturing from the text and reference books	HWs
5-6		3	BJT Amplifiers Classes and Differential Amplifiers.	Lecturing from the text and reference books	HWs & Quizzes 1st Exam : <b>TBD</b>
7-9		3	Power Amplifiers.	Lecturing from the text and reference books	HWs
10-11		5	Operational Amplifiers (Op-Amp).	Lecturing from the text and reference books	HWs 2 <sup>nd</sup> Exam <b>TBD</b>
12-13		5	Operational Amplifier (Op-Amp) Circuits and Applications	Lecturing from the text and reference books	HWs & Quizzes
14-15		4	Amplifier (BJT & FET) Frequency Responses	Lecturing from the text and reference books	HWs Final Exam

**References:**

1. “*Electronic Devices*”, Thomas Floyd, Pearson Education, Inc., 9<sup>th</sup> Edition, 2012.
2. “*Basic Electronics and Linear Circuits*”, N. N. Bhargava, N. N. Bhargava, S. C. Gupta, and D. C. Kulshreshtha, Tata McGraw-Hill, 2006.

**Assessment Methods:**

Methods	Grade	Date
Quizzes and HWs	10	<b>TBD</b>
First Exam	20	<b>TBD</b>
Second Exam	20	<b>TBD</b>
Final Exam	50	<b>TBD</b>

