

Engineering Program

Specialization	Medical Equipment Technology
Course Number	020406102
Course Title	Advanced Physics
Credit Hours	2
Theoretical Hours	2
Practical Hours	0

Brief Course Description:

- ❖ The physical concepts to be studied in this course includes: The Magnetic Field and the Faraday's Law of Induction, inductance and alternating current circuits

Course Objectives:

By the end of the course the students should be able to:

1. Become familiar with the physical concepts in magnetism.
2. Apply faraday laws.
3. Provide a description of how to solve a problem, justifying their choices.
4. Become familiar with the physical concepts of inductance
5. Understand what the AC source is.
6. Understand what the RLC circuit is.
7. calculate power and energy in AC circuit

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	MAGNETIC FIELDS	<ul style="list-style-type: none"> ▪ The Magnetic Field and Forces. ▪ Motion Of a Charged Particle In a Uniform Magnetic Field ▪ Magnetic Force On a Current-Carrying Conductor ▪ Torque On a Current Loop In a Uniform Magnetic Field ▪ Application Involving Charged Particles Moving In a Magnetic Field ▪ The Hall Effect 	9
2.	SOURCES OF THE MAGNETIC FIELF	<ul style="list-style-type: none"> ▪ The biot-savart law ▪ The magnetic force between two parallel conductors ▪ Ampere's law ▪ The magnetic field of a solenoid ▪ Gauss's law in magnetism ▪ The magnetic field of the earth 	7
3.	FARADAY'S LAW	<ul style="list-style-type: none"> ▪ Faraday's Law Of Induction ▪ Motional emf ▪ Lenz's Law ▪ Induced emf And Electric Fields ▪ Generator and motors ▪ Eddy current 	7
4.	INDUCTANCE	<ul style="list-style-type: none"> ▪ Self-Induction And Inductance ▪ RL Circuits ▪ Energy In Magnetic Field ▪ Mutual Inductance ▪ The RLC Circuit 	8
5.	ALTERNATING CURRENT CIRCUITS	<ul style="list-style-type: none"> ▪ Ac Sources ▪ Resistor In an AC Circuit ▪ Inductor In an AC Circuit ▪ Capacitor In an AC Circuit ▪ The RLC Series Circuit ▪ The RLC parallel Circuit ▪ Power In an AC Circuit ▪ Resonance in a series RLC circuit ▪ The transformer and power transmission ▪ Rectifiers and filters 	11

Evaluation Strategies:

Exams		Percentage	Date
Exams	Med-Term Exam	40%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	
Discussions and lecture presentations			

Teaching Methodology:

- ❖ Lectures-boards

Text Books & References:

Text Book:

1. Raymond A. Serway and John W. Jewett, "Physics for scientists and Engineers", 7th edition, Thomson Brooks Publisher, 2007.