

# **ELECTRICITY AND ELECTRICAL CIRCUITS**

Textbook: “**INTRODUCTORY CIRCUIT ANALYSIS** ,” by Robert L.Boylestad

Theory:2 hours, Practically:2 hours, Discussion:1 hour.

## **1-Atoms And Their Structure:**

Nuclear model of the atom, electrons in atom ,Bohr theory, conductors, semi conductors , insulators.

## **2-Mutual Electrical Effect:**

Coulomb law, electrical fields, electrical potential, relation between energy and electric field, electric current .

## **3-Mutual Magnetic And Electric Effects:**

motion of charge in electric field, motion of charge in magnetic field, forces between currents.

## **4-Electromagnetic Field:**

Gauss law, electric polarization, electric properties of materials.

## **5-Magnetic Field:**

magnetic flux, magnetic properties of materials ,magnetic field laws.

## **6-Electrical Circuit:**

resistances ,capacitors, inductors, R-L circuit ,R-C circuit, R-L-C circuit, Lapels equivalent circuit.

## **7-Intrduction of network analysis:**

Thevenins theorem, Norton theorem, superposition theorem, maximum power transfer theorem, substitution theorem.

## **8-Filters:**

filters kinds, low frequency filters , high frequency filters.