

### **Course Specifications**

**Programme(s) on which the course is given : P., P.&las., P.&comp., P.&G., P.&Ch.**

**Major or Minor element of programmes : major - major - minor - minor - minor.**

**Department offering the programme : P., P., P.&Math., P.&G., P.&Ch.**

**Department offering the course Physics**

**Academic year / Level 2**

**Date of specification approval: 2012**

#### **A- Basic Information**

**Title: Electronic optics**

**Code: P233**

**Credit Hours: 3 h      Lecture: 3h**

**Tutorial: 00      Practicals:00      Total: 3h**

#### **B- Professional Information**

##### **1 – Overall Aims of Course**

**by using the interaction between electrons and both electric and magnetic fields the student understand the electron optics**

##### **2 – Intended Learning Outcomes of Course (ILOs)**

###### **a Knowledge and Understanding:**

**After finishing the course the student should be able to**

**a1- understand the configuration of electron microscope(E.M.)**

**a2- explain different kinds of E.M.**

**a3- know about applications of E.M. (T.E.M & S.E.M.)**

###### **b Intellectual Skills**

**b1-the student should be able to differentiate between light and E.M.**

###### **c Professional and Practical Skills**

**c1- The student will be able to use the E.M.**

###### **d General and Transferable Skills**

**d1-the student will understand the physical**

**process of the interaction between electrons  
and electric and magnetic fields**

### **3- Contents**

<b>Topic</b>	<b>No. of hours</b>	<b>Lectur e</b>	<b>Tutor ial/Pr actica l</b>
<b>Geometrical electron optics</b>	<b>18</b>	<b>6</b>	
<b>Structure of S.E.M</b>	<b>12</b>	<b>4</b>	
<b>Structure of T.E.M</b>	<b>12</b>	<b>4</b>	

### **4– Teaching and Learning Methods**

**4.1- lectures**

**4.2-project assignment**

### **5- Student Assessment Methods**

**5.1 Disscutions ..... to assess student scientific  
thinking**

**5.2 Reaserch projects .... to assess the overall  
outcome**

**5.3 Written exam**

### **Assessment Schedule**

**Assessment 1 oral exams  
every week**

**Assessment 2 written and reaserch  
projects Week final**

### **Weighting of Assessments**

<b>Mid-Term Examination</b>	<b>20</b>
<b>%</b>	
<b>Final-term Examination</b>	<b>60 %</b>
<b>Semester Work</b>	<b>20 %</b>
<b>Total</b>	<b>100</b>
<b>%</b>	

## **6- List of References**

**6.1- Course Notes**

**6.2- Essential Books (Text Books)**

**electron optics & electron microscopy P.Griet, P.**

**Hwakes Introduction to E. microscopy**

**S.Winschnitzer.**

**6.3- Recommended Books**

**6.4- Periodicals, Web Sites, ... etc**

## **7- Facilities Required for Teaching and Learning**

**Instrumentation, models, computers, softwares and internet facility**

**Course Coordinator :.Dr .Yasser**

**Rammaah**

**Head of Department: Prof.Dr. Sana**

**Maize**

**Date: / /**