Course Specifications

A- Basic Information

Program(s) on which the course is given: physics
Major or Minor element of program: Major
Department offering the program:
Physics,
Department offering the course: Physics
Academic year / Level: 3ed level > 72hr
Date of specification approval: 2012

Title: Accelerators
Code: P357 Credit Hours: 2
Lecture: 2
Tutorial: 0 Practical: 0 Total: 2

B- Professional Information

1 – Overall Aims of Course

The overall aim of this course, students will be acquainted with the principles of charged particle acceleration, different types of accelerators, theory and conditions of operation and relativistic effect, finally student will be familiar with different applications of accelerators & advantages and disadvantages of each type. Students, independently, will be able to predict the accelerator parameters and solve for the energy of charged particles.

2 – Intended Learning Outcomes of Course (ILOs)

a- Knowledge and Understanding:

After completing the course the student should

a1 - Know the basics of particle acceleration

a2 - have basic knowledge of motion in electric field and magnetic field , Magnetic lens (dipole and quadrupole)

a3-understand of operational mechanisms of different

type of accelerator

b- Intellectual Skills

completing this course will:

b1- develop the student ability to listen carefully , to read demanding text

b2- help the student ability to present complex information in sample way

b3- enhance the mathematical , computational , modeling skills

c- Professional and Practical Skills

After completing the course the student should

c1- Be familiar with different application of particle accelerators

General and Transferable Skills

The student will be able to

d1- use the Internet

d2- write assigned reports

d3- have oral communication during presenting their reports .

3- Contents

Topics actually taught	No. of hrs	No.of Lectures
1- Introduction to ion source	2	0.66
2- Introduction to accelerator	2	0.66
optics	6	2
3- Electrostatic accelerator	6	2
4- Cyclotron Accelerator	4	1.33
5- Cynchrotrons	4	1.33
6- linear accelerator	6	2
7- Betatron electron	12	4
accelerator		
8- Colliding beam accelerator		
9- Application of particle		
accelerator		

4– Teaching and Learning Methods

4.1- Course notes

4.2- Reports Assignment

4.3- Oral presentations

5- Student Assessment Methods

5.1 Reports to assess skill of collecting data & solving problem

5.2 Oral to assess skill of discussing and analyzing data

5.3 mid-term exam to assess understanding and memorizing skills

5.4 Final term exam to assess Overall performance

Assessment Schedule

Assessment 1 : assignments by the end of chapter

Assessment 2 : presentation every 3 weeks

Assessment 3 : mid-term 7^{th} week

Assessment 4 : Final term 14^{th} week

Weighting of Assessments

Mid-Term Examination	**20 %**
Final-term Examination	**60 %**
Oral Examination.	**5 %**
Repots	**5 %**
Semester Work	**5 %**
Other types of assessment	**5 %**
Total	**100%**

6 List of References

6.1- Course Notes

6.2- Essential Books & Internet Web

1.Nuclear physics, by Kaplan

6.3- Recommended Books

1.Introductory Nuclear Physics by Kren

2.Principles of charged particle Acceleration, By Stanley Humphries, Jr.

-Text books

7- Facilities Required for Teaching and Learning

7.1 Data show a

7.2 Overhead projectors

7.3 White board

Course Coordinator: Professor..Hussein El Samman

Head of Department: Prof.Dr. Sana Maize

Date: / /