Course Specifications

Programme(s) on which the course is given : P., P.&comp.
Major or Minor element of programmes : minor – minor.
Department offering the programme : P., P.&Math.,
Department offering the course *Physics*
Academic year / Level Senior (3)
Date of specification approval 2012

A- Basic Information

Title: High energy physics Code: 356

Credit Hours: 3 hr Lecture: 3h
Tutorial: 00 Practicals:00 Total: 3hr

B- Professional Information

1 – Overall Aims of Course

*** To provide detailed information about the smallest possible building blocks in nature including cosmic –rays**
*** To provide highlights about the characteristics of the forces that holding particles in nature and about the possibility of combining these forces together**
***To introduce the important roles of virtual particles and the need for ultra high energy accelerators**
***To introduce methods for particle classifications, interactions and detection**

2 – Intended Learning Outcomes of Course (ILOs)

a Knowledge and Understanding:

After completing this course the student should be able to

a1- identify of hundreds of particles in the subnuclear zoo and methods of classification
a2- explain mathematical methods of energy loss and penetration of ionizing radiation through matter
a3- illustrate the existence of particle-antiparticle

systems, the four types of forces, conservation laws to serve for interaction, classification, Gell Mann and his collaborators theory, properties of quarks and color charge of quarks

b Intellectual Skills

After completing this course the student should be able to

b1- solving problems covering the materials of the course.

b2- Student should handle in an essay to develop his/her writing and understanding skills

c Professional and Practical Skills

After completing this course the student should be able to

c1- apply the gained information about the subnuclear zoo of particles.

c2-apply the gained experience dealing with conservation laws that serving in particle interaction classifications.

c3-interpret his understanding about he different mathematical treatments covered in some parts of the course.

d General and Transferable Skills

d1-gainning experience from the oral communication through sheets of problem-solving.

d2-ability of giving 10 minutes presentation on a student slf-choosing topic either from the cours material or related toit.

3- Contents

Topic	No. of h	Lecture	Tutorial/Practical

	ours		
Theory of energy loss of charged particles in composite media	**4**	**2**	**00**
Dual wave-particle nature and quatum mechanical treatment of creation and destruction	**3**	**2**	**00**
Forces of interactions and properties of virtual particles	**3**	**2**	**0**
Classification of particles according to mass and interactions-resonance particles-Feynman diagrams.	**8**	**5**	**00**
Conservation laws and iteraction classification	**3**	**2**	**00**
Theory of quantum chrodynamic and properties and binding of quarks.	**4**	**3**	**00**
Energy in nuclear reaction (threeshould , particle production, particledecay, track particle detection.	**8**	**5**	**00**

4– Teaching and Learning Methods

4.1-lectures

4.2- disscutions

5- Student Assessment Methods

5.1 midterm written exam to assess understanding about the covered first part of the course

5.2-semester activity. to develop communication skills..

5.3 final written exam to assess the overall gain from the course materials

5.4 homework sheets to assess solving problems skills and time constrain

5- Student Assessment Methods

5.1 sheat exams to assess the theoretical knowledge

5.2 disscutions to assess student scientific thinking

5.3 reaserch projects to assess the overall outcome

Assessment Schedule

Assessment 1	**sheet exam**	**Week 8&16 (mid &final term).**
Assessment 2	**oral exams**	**Week every week**
Assessment 3	**written exam**	**Week 15**

Weighting of Assessments

Mid-Term Examination	**20**	**%**
Final-term Examination	**60**	**%**
Oral Examination.	**10**	**%**
Semester Work	**10**	**%**
Total	**100**	**%**

6- List of References

6.1- Course Notes

experimental physics ,department of physics,2005.

6.2- Essential Books (Text Books)

K.S.Krane,Introduction nuclear physics (John Wiely &sons,New Yprk,1998).

-P.E.Hodgson,E.Gadioli and E.Go,Introductory nuclear physics(Oxford Science Puplications,200)

6.3- Recommended Books

6.4- Periodicals, Web Sites, … etc

www.sciencedirect.com.
Searching for nuclear physics sites
Searching for Partile physics sites

7- Facilities Required for Teaching and Learning

Overhead projector

Course Coordinator: Prof.Dr.Abdel Azim Hussein
Head of Department: Prof.Dr. Sana Maize
Date: / /