



COURSE SPECIFICATION

King Khalid University – Faculty of Science
Physics Department
Phys 461

2013

Institution: King Khalid University
College/Department : Faculty of science/ Physics Department

A Course Identification and General Information

1. Course title and code: 461-Phys.
2. Credit hours: 3
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs)
The Academic program at the Physics Department
4. Name of faculty member responsible for the course Dr. Ibrahim Sayed Mohammed Hussein
5. Level/year at which this course is offered : 7/ 4th year
6. Pre-requisites for this course (if any) : 354 Phys.
7. Co-requisites for this course (if any): -.
8. Location if not on main campus: Department of physics /C building /King Khalid university / Girigr /Abha.

B Objectives

<p>1. Summary of the main learning outcomes for students enrolled in the course.</p> <ul style="list-style-type: none"> • Learn the basic concepts in atomic physics and theories proposed to describe the construction and how atomic emission spectroscopy for atoms with different highlight the importance of the scientific process. • Increase the practical achievement of students and prepare them for understanding of sophisticated applied areas in practical life and scientific research.
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field)</p> <ul style="list-style-type: none"> • The growing use of references available on the network or via information technology. • Use interactive physics software to clarify the installation of corn and the distribution. of electrons around. • The use of different learning sources such as scientific literature English. • Work on a regular basis to renew the list of references

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

- **Looking this decision in a core disciplines of modern physics in some details and includes a quick review of construction models of atomic and Bohr atom and model Bohr and Somerfield and Meson's atom and hydrogen spectrum and Schrodinger equation and assumptions of quantum theory and Quantum four numbers – The Pauli's exclusion principle- and Hund's rule and the spectrum of mono-valence and di-valence atoms – The effect of external magnetic field - the multi-electron atoms - the periodic table**

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
• Atomic structure (Thomson's model – Rutherford's model - Atomic spectrum)	1	3
• Review of the Bohr's atom and the hydrogen spectrum - the movement of the nucleus and its impact.	1	3
• Model Bohr's and Somerfield's the - insufficiency of quantum old theories- Meson's Atom.	1	3

<ul style="list-style-type: none"> • Schrodinger's equation and its simple applications, Classical wave equation - Quantum mechanics hypothesis - GPS data polarity Alkrroah - Schrodinger's equation and its wave quantity – Assumptions of quantum mechanics - Schrodinger's equation in terms of spherical polar coordinates - the separation variables in polar coordinates. 	2	6
<ul style="list-style-type: none"> • Quantum numbers (The basic quantum number - the orbital quantum number - the magnetic quantum number – Spin quantum number) 	2	6
<ul style="list-style-type: none"> • Movement in the central field - Angular momentum and positive functions - The wave functions of the hydrogen atom and energy levels with the spinning and clauses 	2	6
<ul style="list-style-type: none"> • Magnetic spectrum analysis 	1	3
<ul style="list-style-type: none"> • Pauli's exclusion principle – Hund's rule for the distribution of electrons - Valence electron theory - the periodic table of elements – Excited levels of an atom - Spectral series - selection rules 	2	6
<ul style="list-style-type: none"> • spectrum of mono-valence and di-valence atoms - Electronic spectrum of the hydrogen atom. 	3	9
	15	45

2 Course components (total contact hours per semester): 30			
Lecture: 45	Tutorial: No	Practical/Fieldwork/Internship: No	Other: No

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week): **No**

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

<p>a. Knowledge</p>
<p>(i) Description of the knowledge to be acquired</p> <p>1 - Introduce to the students the key concepts of atomic models and historical development to describe the atom model.</p> <p>2 - Enable the students to understand the components of Atom.</p> <p>3 - To help students understand the many spectral phenomena in physics.</p> <p>4 - Introduce to the students to a set of theoretical and experimental approaches used in various researches in the field of atomic physics and spectrums.</p> <p>5 - To train students to write research on selected topics in the field of atomic physics and spectra.</p>
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <p>1 – Lectures.</p> <p>2 - Discussion within the classroom</p> <p>3 - Seminars collective discussion about the atoms and its applications on our life.</p> <p>4- How to classify the periodic table elements and distinguish between the all elements through quantum numbers.</p> <p>5- Using the internet data base to collect lectures on the Atomic and Spectra courses.</p>
<p>(iii) Methods of assessment of students cognitive skills</p> <p>1 - To participate in the study.</p> <p>2 - Short tests.</p> <p>3 - Quarterly tests/questions objectively and editorial.</p> <p>4 - Final test.</p>
<p>c. Interpersonal Skills and Responsibility</p>

<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p> <p>The students should learn how to:</p> <p>1 - Scientific thinking ability to analyze the phenomena of atomic spectrum. 2 - The ability to understand and explore the applications of modern knowledge of atomic physics. 3 - The ability to use language skills in scientific discussions and quarterly through the use of correct scientific linguistic expressions to describe the atomic structure.</p>
<p>(ii) Teaching strategies to be used to develop these skills and abilities</p> <p>1-Lectures and training students to understand and grasp the atomic structure and spectra. 2 - Discussion within the classroom and to train students to scientific thinking and encourage them to participate in panel discussions.</p>
<p>(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility</p> <p>1 - Participation in the classroom. 2 - Short tests / quarterly / final</p>
<p>d. Communication, Information Technology and Numerical Skills</p>
<p>(i) Description of the skills to be developed in this domain.</p> <p>1 - Students can complete clerical duties and literacy in time. 2 - Students can participate in the quarterly discussion and thinking in a scientific way. 3 - Students can act in a responsible and ethical manner during the discussion. 4 –Student posses in his capacity as a member of the team skills necessary to communicate and listen and negotiate and evaluate the strengths and weaknesses he has.</p>
<p>(ii) Teaching strategies to be used to develop these skills</p> <p>1 - Lectures that will make the student understand the importance of proficiency in the disposition of a matter of time. 2 - Hold discussions with students about the skills needed to teach. 3 - Do with Individual consultations during office hours</p>
<p>(iii) Methods of assessment of students numerical and communication skills</p> <p>1 - Active participation within the school room teaching reflects a student's ability to participate in discussions. 2 - Demonstrate the quarterly results of the tests and the final test over the student's skill in data collection and installed.</p>

e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required None
(ii) Teaching strategies to be used to develop these skills None
(iii) Methods of assessment of students psychomotor skills None

5. Schedule of Assessment Tasks for Students During the Semester			
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Mid term 1	Week No. Eight	15 %
2	Participating	Throughout the total term time	5 %
3	Mid term 2	Week No. Thirteen	15 %
4	Participating	Throughout the total term time	5 %
5	Short exams	Throughout the total term time	10 %
6	Final examination	Week No. Sixteen	50 %
7			100 %

D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice.
(include amount of time faculty are available each week)

3 hours per week

E Learning Resources

1. Required Text(s)

1- الفيزياء الذرية – للاستاذ الدكتور. عبد الفتاح إبراهيم هلال والدكتور. خالد بن علي كماخي
مركز النشر العلمي – جامعة الملك عبد العزيز – ص.ب. 1540 – جدة – 21441

الملكة العربية السعودية (1415 هـ - 1994 م)
 2- موقع الفيزياء التعليمي :: موقع الدكتور حازم فلاح سكيك
 3- محاضرات الدكتور حازم فلاح سكيك في الفيزياء الذرية والأطياف

2. Essential References 1-The Theory of Atomic Structure and Spectra / Robert D.Cowan.
2-Modern Physics /Eisberg.
3-Electronic materials and websites ... etc.
4-Other learning materials, such as programs that rely on the computer or CD-ROM or professional standards or regulations.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e, number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) Lecture halls suitable for the number of students.
2. Computing resources Computers and Data Show.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) Display device data to facilitate explanation of the student's tests.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching -Evaluation distribution to students after final exams in order to draw the teacher's attention to the strengths and weaknesses in the presentations by the faculty to provide. - An open dialogue with the students on a regular basis for their opinions about how successful due in achieving its objectives.
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department None
3 Processes for Improvement of Teaching -Attend training courses. -Attend workshops in order to facilitate the exchange of experiences between faculty members. -Attending the workshops for the organization of meetings with colleagues to discuss some of the issues and find solutions. -Discuss the challenges within the halls of the study with colleagues and members

<p>of the board of the department.</p> <ul style="list-style-type: none"> -To encourage faculty members to attend conferences developments in their field of specialization. -Follow-up developments in the field of specialization at both theoretical and practical. -Set goals to achieve excellence in teaching at the beginning of each new semester on the back of last quarter results and teaching strategies that have been used and well as testimonies students. -Follow the latest developments on the new versions (articles or books) related topics which included scheduled.
<p>4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)</p> <ul style="list-style-type: none"> -Returns quarterly research papers for students and provide them with answers typical in this regard. -The student can refer to the sources to which he read to compare the answers of the information contained in those sources. - In the case of a student feeling not to get the degree to which it deserves can compare his typical answer sheet.
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> - Comparison of the curriculum and characterization due to those that exist in other universities (including those available to the network). - Comparison of the objectives of decision degree student's benefit.

Name of Course Instructor: **Dr Ibrahim Sayed Mohammed Hussein**

Signature: **___Ibrahim Sayed Mohammed Hussein**

Date Report Completed: 30-12-2013

Received by Program Coordinator

Date: 26-5-2-14