



# **COURSE SPECIFICATION**

**Modern Practical Physics (455 phys\_2)**

**1434/1435**

# Course Specification

<b>Institution: KingKhaledUniversity</b>
<b>College/Department : Faculty of science/ physics department</b>

## A Course Identification and General Information

<b>1. Course title and code: Practical Modern Physics, 455 Phys_2.</b>
<b>2. Credit hours: 4</b>
<b>3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs)</b>  <b>The Academic program at the Dept. Physics,</b>
<b>4. Name of faculty member responsible for the course Ibrahim M. Ghnaim.</b>
<b>5. Level/year at which this course is offered : third year / level 6</b>
<b>6. Pre-requisites for this course (if any) : Modern Physics.</b>
<b>7. Co-requisites for this course (if any): None.</b>
<b>8. Location if not on main campus: Department of physics /D building / university city/ Girigr /Abha.</b>

## B Objectives

<p><b>1. Summary of the main learning outcomes for students enrolled in the course.</b></p> <ul style="list-style-type: none"><li>- Student ability Development in the search for different physical phenomena.</li><li>- Detection and analysis of phenomena and write their own reports.</li><li>- Identifying the hardware and how to deal with it.</li><li>- Establishing the theoretical concepts received in lectures and to prove it in practice.</li></ul>
<p><b>2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)</b></p> <ul style="list-style-type: none"><li>-Increasing the use of IT or web based reference material, changes in content as a result of new research in the field.</li><li>- Using some conventional textbooks or from Internet.</li><li>- Work on a regular basis to change the list of references which may include some of the original electronic articles.</li><li>- Use <a href="http://www.wiki.com">www.wiki.com</a> and <a href="http://en.wikipedia.org">http://en.wikipedia.org</a> as reference sources may require students to get more information about some of the topics in the field of modern physics and atomic.</li></ul>

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

<b>1 Topics to be Covered</b>		
<b>Topic</b>	<b>No of Weeks</b>	<b>Contact hours</b>
<b>1 Photoelectric Effect and Planck's Constant.</b>	<b>1</b>	<b>4</b>
<b>2- Mass Spectrometer's work and Relative Effects.</b>	<b>1</b>	<b>4</b>
<b>3- Ionization Potential of Argon Gas.</b>	<b>1</b>	<b>4</b>
<b>4- Millikan Experiments to Determine the Charge of the Electron.</b>	<b>1</b>	<b>4</b>
<b>5- Spectrum of Hydrogen and the Rydberg Constant.</b>	<b>1</b>	<b>4</b>
<b>6- Thermionic Effect.</b>	<b>1</b>	<b>4</b>
<b>7- Determination of the Electron Temperature.</b>	<b>1</b>	<b>4</b>
<b>8- Resonant Transition in Hydrogen-like Ions</b>	<b>1</b>	<b>4</b>

<b>9- Specific Charge of the Electron.</b>	<b>1</b>	<b>4</b>
<b>10- Frank Hertz Experiments.</b>	<b>1</b>	<b>4</b>

<b>2 Course components (total contact hours per semester):</b>			
<b>Lecture: 44</b>	<b>Tutorial:</b> _____	<b>Practical/Fieldwork/Internship: 44</b>	<b>Other: _____</b>

**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)**  
None

**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.**

**a. Knowledge**

**(i) Description of the knowledge to be acquired**

- **Student ability Development in the search for different physical phenomena.**
- **Detection and analysis of phenomena and write their own reports.**
- **Identifying the hardware and how to deal with it.**
- **Establishing the theoretical concepts received in lectures and to prove it in practice.**

<p><b>(ii) Teaching strategies to be used to develop that knowledge</b></p> <ul style="list-style-type: none"> <li>- Theoretical explanation of the experience.</li> <li>- Perform a part of the experiment to students at physics lab.</li> <li>- Each student performs the experiment himself.</li> <li>- Follow-up students during the performance experiment.</li> <li>- Evaluation of the results obtained by students</li> </ul>
<p><b>(iii) Methods of assessment of knowledge acquired</b></p> <ul style="list-style-type: none"> <li>- Participation within the lab.</li> <li>- Prepare a full report on the experiment (The Name of The Experiment - Purpose - Apparatus - Theory - Method - Results and Calculations).</li> <li>- Quarterly exams.</li> <li>- Final exam.</li> </ul>
<p><b>b. Cognitive Skills</b></p>
<p><b>(i) Cognitive skills to be developed</b></p> <ul style="list-style-type: none"> <li>- The experimental capabilities of students in the search for different physical phenomena.</li> <li>- Identifying the devices and how to deal with them.</li> <li>- The ability to connect the practical results of the experiment to the theoretical laws</li> </ul>
<p><b>(ii) Teaching strategies to be used to develop these cognitive skills</b></p> <ul style="list-style-type: none"> <li>- Student performance of the experiment with the follow-up.</li> <li>- Looking for the subject of experiment on the Internet by the student.</li> </ul>

<p><b>(iii) Methods of assessment of students cognitive skills</b></p> <ul style="list-style-type: none"> <li>- Participation within the lab.</li> <li>- Prepare a full report on the experiment.</li> <li>- Quarterly/Final exams.</li> <li>- Sudden short exams</li> </ul>
<p><b>c. Interpersonal Skills and Responsibility</b></p>
<p><b>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</b></p> <ul style="list-style-type: none"> <li>- The use of electronic journals and databases.</li> <li>- The use of specialized web sites for more information relating to the physical experiment.</li> </ul>
<p><b>(ii) Teaching strategies to be used to develop these skills and abilities</b></p> <ul style="list-style-type: none"> <li>- Encourage students to try to make the most of the information available on the web.</li> <li>- Encourage students to try to identify the specialized sites and the use of specialists in the computer lab on the information contained in these sites.</li> <li>- Require the use of PowerPoint program for presentations</li> </ul>
<p><b>(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility</b></p> <ul style="list-style-type: none"> <li>- Giving degrees for the use of the information available on the web.</li> <li>- Distribution of the instructions paper at the beginning of the work for the student to know focus points which will covered in the evaluation process.</li> </ul>
<p><b>d. Communication, Information Technology and Numerical Skills</b></p>
<p><b>(i) Description of the skills to be developed in this domain.</b></p>

<ul style="list-style-type: none"> <li>- Submitting reports or essays and exchanging information between the students through the conventional ways.</li> <li>- Or by using the databases and the electronic mail.</li> </ul>
<p><b>(ii) Teaching strategies to be used to develop these skills</b></p> <ul style="list-style-type: none"> <li>- Using computers.</li> <li>- Using special educational packages.</li> </ul>
<p><b>(iii) Methods of assessment of students numerical and communication skills</b></p> <ul style="list-style-type: none"> <li>- Preliminary evaluation is required.</li> <li>- Final evaluation is subjected to various skills e.g. student communication until the final tests.</li> </ul>
<p><b>e. Psychomotor Skills (if applicable)</b></p>
<p><b>(i) Description of the psychomotor skills to be developed and the level of performance required</b></p> <ul style="list-style-type: none"> <li>- None</li> </ul>
<p><b>(ii) Teaching strategies to be used to develop these skills</b></p> <ul style="list-style-type: none"> <li>- None</li> </ul>
<p><b>(iii) Methods of assessment of students psychomotor skills</b></p> <ul style="list-style-type: none"> <li>- None</li> </ul>

<b>5. Schedule of Assessment Tasks for Students During the Semester</b>			
<b>1</b>	<b>The first quarterly exam</b>	<b>Sixth week</b>	<b>10%</b>
<b>2</b>	<b>Participation</b>	<b>Continuously throughout the season</b>	<b>10%</b>
<b>3</b>	<b>Reports</b>	<b>Continuously throughout the season</b>	<b>20%</b>

<b>4</b>	<b>Second quarterly exam</b>	<b>Week XIII</b>	<b>10%</b>
<b>5</b>	<b>Final exam</b>	<b>Week XVI</b>	<b>50%</b>

#### **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):**  
**10 hours per week.**

#### **E Learning Resources**

<b>1. Required Text(s):</b> <b>Practical Modern Physics.</b>
<b>2. Essential References</b>
<b>3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)</b>
<b>4-.Electronic Materials, Web Sites etc</b>
<b>5- Other learning material such as computer-based programs/CD, professional standards/regulations</b>  <b>-None</b>

#### **F. Facilities Required**

<b>Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)</b> <b>A Computer Lab. With 20 PCs for 20 students.</b>
<b>1. Accommodation (Lecture rooms, laboratories, etc.)</b> <b>Main hall for lecturing 20 students.</b>
<b>2. Computing resources</b>  <b>20 computer sets are needed for network connection.</b>



**3. Other resources (specify --e.g. If specific laboratory equipment is required, list requirements or attach list)**  
**Experimental Setup for Modern Physics Lab.**

## **G Course Evaluation and Improvement Processes**

**1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching**  
The student should evaluate the course together with the instructor.  
- A questionnaire to students in the final tests in order to draw the teacher's attention to the strengths and weaknesses in presentations which were presented.  
- Students evaluate the course electronically at the end of the semester.  
- Questioning the students and the teacher at the end of the semester about the successes and failures of the course.  
- An open dialogue with students on a regular basis for their views on how successful the achievement of course objectives

**2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department**  
- Students evaluate the course electronically at the end of the semester.

**3 Processes for Improvement of Teaching**  
- Attend training courses.  
- To attend the workshops in order to facilitate the exchange of experiences between faculty members.  
- Setting the agenda for the organization of meetings with colleagues in order to discuss some of the issues and find solutions.  
- Discuss the challenges in the classroom with colleagues and members of the board of the department.  
- Encourage faculty members to attend conferences in the field of developmental specializations.  
- Follow developments in the area of specialization on both theoretical and practical.  
- Setting goals for achieving excellence in teaching at the beginning of each new semester on the back of results for the past quarter and teaching strategies that have been used and well as testimonies of students.  
- Follow the latest developments on the new versions (articles, books) related topics which included in the course.

**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)**

- 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 answers of the information contained.
- In the event that a student not satisfies on his degree, he can compare his paper with those who got better grades.

**5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.**

- Comparing the description and course specification to those that exist in other universities (including available on the network).
- Comparing the objectives of course with the degree of students benefit.
- Trying to connect with members at other universities teaching similar courses and exchange views with them about what can be done to develop the course