Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

General Physics I Course Specification (PHYS 201)
Course Specifications

Institution: Majmaah University  
Date of Report: 10/4/2014

College/Department: College of Science / Department of Physics

A. Course Identification and General Information

1. Course title and code: General Physics I (PHYS 201)

2. Credit hours: 4 (3+2+0)

3. Program(s) in which the course is offered.
   (If general elective available in many programs indicate this rather than list programs)
   Bachelor of Physics (BSc.)

4. Name of faculty member responsible for the course:
   Dr. Samir Al-zobaidi

5. Level/year at which this course is offered: 3rd level / 2nd year

6. Pre-requisites for this course (if any): ---

7. Co-requisites for this course (if any): ---

8. Location if not on main campus:
   Complex of colleges in Al-Zulfi

9. Mode of Instruction (mark all that apply)
   
   a. Traditional classroom  √  What percentage?  75
   b. Blended (traditional and online)  What percentage?  
   c. e-learning  What percentage?  
   d. Correspondence  What percentage?  
   f. Other  √  What percentage?  25

   Comments:

   The other 25% is conducted in the laboratory.

B. Objectives
1. What is the main purpose for this course?

This course is an introductory course for the fundamental principles of physics in mechanics. The student will be studying the main concepts of: Mechanics, dynamics, gravitation, energy, momentum and fluid dynamics.

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)

It is intended in this course to:
1. Update the content periodically.
2. Spare more working hours on e-learning, where some lectures and short exams will be delivered online.
3. Use more software simulations to some of the principles covered.
4. Add new experiments in the laboratory that covers the topic of energy.

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

A full academic year is equivalent to 36 Credit hour, which each semester is to be 18 Credit hour. Each course is credited with a number of credit hour (>=2) according to the student's workload (contact hours, laboratory work, examination etc) and accumulation of credits hour is accomplished after successful completion of the course. In this case, one Credit hour is equal 25 – 30 student's workload hour.

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

(The credit point is equal 25-30 hours )

<table>
<thead>
<tr>
<th>Topic</th>
<th>Contact hours</th>
<th>Self-Study</th>
<th>Work Load</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lecture</td>
<td>tutorials</td>
<td>Lab</td>
</tr>
<tr>
<td>Physics and Measurements</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Motion in 1 dimension</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Vectors</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Motion in 2 dimensions</td>
<td>6</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Mid-term 1</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Laws of motion</td>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>
Energy and energy transfer  | 5 | 5 | 4 | 1 | 2 | 1 | 13
Potential energy         | 3 | 3 | 2 | 1 | 2 | 1 | 9
Mid-term 2               | 1 | 1 |   |   |   | 1 |
Linear momentum and collisions | 4 | 2 | 6 | 3 | 1 | 2 | 2 | 1 | 15
Elasticity               | 1 | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 11
Fluid mechanics          | 5 | 5 | 4 | 1 | 2 | 1 | 13
Review                   | 2 | 2 |   |   |   |   | 2 |
Final Exam               | 2 | 2 | 2 |   |   |   | 2 |
Total                    | 45| 24| 69| 31| 10| 27| 20| 10| 167

2. Course components (total contact hours and credits per semester):

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Practical</th>
<th>Other:</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Hours</td>
<td>45</td>
<td>24</td>
<td>69</td>
<td>31</td>
<td>10</td>
<td>167</td>
</tr>
<tr>
<td>Credit</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

3. Additional private study/learning hours expected for students per week.

6.5 hours

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy:

For each of the domains of learning shown below indicate:
1. A brief summary of the knowledge or skill the course is intended to develop;
2. A description of the teaching strategies to be used in the course to develop that knowledge or skill;
3. The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The National Qualification Framework provides five learning domains. Course learning outcomes are required. Normally a course should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.
On the table below are the five NQF Learning Domains, numbered in the left column.

**First**, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.
## NQF Learning Domains and Course Learning Outcomes

<table>
<thead>
<tr>
<th>Course Teaching Strategies</th>
<th>Course Assessment Methods</th>
</tr>
</thead>
</table>

### 1.0 Knowledge

**1.1** To know and describe the basic principles of mechanics, dynamics, energy, and momentum.
- Lectures
- In-class discussions
- Exams.
- Homework.
- Classwork.
- Quizzes.

**1.2** To apply the formulas learned to solve the different applications of the related topics.
- Exercises
- Labs.
- Reports.
- In-lab. evaluation.

### 2.0 Cognitive Skills

**2.1** To distinguish between the one and two dimensional mechanics, kinetic and potential energies, elastic and inelastic collisions, and to analyze the schematics and diagrams related to it.
- Lectures.
- Problem solving
- Case study.
- Small group work.
- Lab. demonstrations.
- Exams.
- Homework.
- Classwork.
- Quizzes.

**2.2** To write laboratory reports. Relate the experiments to the theories related. To explain and justify the results obtained from the experiment.
- Lab. Reports.
- In-lab. evaluation.

### 3.0 Interpersonal Skills & Responsibility

**3.1** To participates in class discussion. Practice the safety and organizing rules of the laboratories.
- Awareness of time management in completing their reports.
- Encourage students to help each other
- Group assignments
- Lectures.
- Case study.
- Small group work.
- Lab. demonstrations.
- Whole group discussion.
- Respecting deadlines.
- Helping each other in doing their experiments.
- Giving clear and logical arguments
- In-lab. evaluation
- (Showing active class participation).
- Oral exams.

**3.2** To act with self-reliance when working independently. Displays teamwork and shows professional commitment to ethical practice.

### 4.0 Communication, Information Technology, Numerical

**4.1** To communicate with the teacher and students using communications technology.
- Encourage students to use program soft wear
- Whole group discussion.
- Lecture.
- Lab. demonstrations.
- E-mail correspondences.
- E-learning.
- Exams.
- Homework.
- Lab reports

**4.2** To use software programs in writing, inserting and analyzing data, and plotting graphs.
| 5.1 | To assemble the experiment correctly. To operate the experiment and any attached computer quickly and accurately. | • Lab. demonstrations. | • Lab. reports. • In-lab. evaluation |
| 5.2 | To measure the different physical parameters in the laboratory professionally and accurately. |

### Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching

<table>
<thead>
<tr>
<th>NQF Learning Domains</th>
<th>Suggested Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write</td>
</tr>
<tr>
<td>Cognitive Skills</td>
<td>estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict, justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise</td>
</tr>
<tr>
<td>Interpersonal Skills &amp; Responsibility</td>
<td>demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write</td>
</tr>
<tr>
<td>Communication, Information Technology, Numerical</td>
<td>demonstrate, calculate, illustrate, interpret, research, question, operate, appraise, evaluate, assess, and criticize</td>
</tr>
<tr>
<td>Psychomotor</td>
<td>demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble, experiment, and reconstruct</td>
</tr>
</tbody>
</table>
Please fill in this table based on the following criteria:

1. Based on your course syllabus, provide 3 - 5 major course objectives in column 1 along with 2 - 3 outcomes for each objective in column 2.
2. In column 3, indicate how the objectives and outcomes in column 1 and 2 map into ME Program Learning Outcomes (PLO)
3. In column 3, indicate how the objectives and outcomes in columns 1 and 2 map into the NCAAA Outcomes
4. In column 4, indicate how the objectives and outcomes in columns 1 and 2 map into the Asiiin criteria
5- Learning outcomes in step 2, 3, 4 are listed in (Physics Program Guidance)

<table>
<thead>
<tr>
<th>Course Objectives:</th>
<th>Course Outcomes:</th>
<th>PLO</th>
<th>NCAAA</th>
<th>ASIIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide a clear understanding of the basic concepts and integrating their knowledge in the disciplines of mechanics, dynamics, energy, and momentum.</td>
<td>To know and describe the basic principles of mechanics, dynamics, energy, and momentum.</td>
<td>a, b</td>
<td>1, 2</td>
<td>a, b</td>
</tr>
<tr>
<td></td>
<td>To apply the formulas learned to solve the different applications of the related topics.</td>
<td>a, b</td>
<td>1, 2</td>
<td>c, d</td>
</tr>
<tr>
<td></td>
<td>To distinguish between the one and two dimensional mechanics, kinetic and potential energies, elastic and inelastic collisions, and to analyze the schematics and diagrams related to it.</td>
<td>c, d, e</td>
<td>4, 5, 6</td>
<td>e, f</td>
</tr>
</tbody>
</table>

Suggested verbs not to use when writing measurable and assessable learning outcomes are as follows:

Consider, Maximize, Continue, Review, Ensure, Enlarge, Understand, Maintain, Reflect, Examine, Strengthen, Explore, Encourage, Deepen

Some of these verbs can be used if tied to specific actions or quantification.

Suggested assessment methods and teaching strategies are:

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.
5. Schedule of Assessment Tasks for Students During the Semester

<table>
<thead>
<tr>
<th>Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)</th>
<th>Week Due</th>
<th>Proportion of Total Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  First exam</td>
<td>5-6</td>
<td>15 %</td>
</tr>
<tr>
<td>2  Second Exam</td>
<td>10-11</td>
<td>15 %</td>
</tr>
<tr>
<td>3  Final Exam</td>
<td>16</td>
<td>40 %</td>
</tr>
<tr>
<td>4  Lab. reports</td>
<td>weekly</td>
<td>10 %</td>
</tr>
<tr>
<td>5  In-lab. evaluation</td>
<td>weekly</td>
<td>5 %</td>
</tr>
<tr>
<td>6  Final practical exam</td>
<td>15</td>
<td>10 %</td>
</tr>
<tr>
<td>7  Quizzes</td>
<td>--</td>
<td>5 %</td>
</tr>
<tr>
<td>8  Homework</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>9  classwork</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100 %</td>
</tr>
</tbody>
</table>

D. Student Academic Counseling and Support

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

At least 5 office hours weekly is assigned for student’s consultations and academic advices.

Additional academic advice could be sought from the academic advisor assigned for each student, or from the unit of academic guidance.

E. Learning Resources

1. List Required Textbooks:

**Physics for scientists and engineers; Raymond A. Serway and John W. Jewett; Cengage Learning; 9th edition; (2013).**

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc.):

   - **Physics; John D. Cutnell and Kenneth W. Johnson; John Wiley & Sons; 9th edition; (2012).**
   - **College Physics; Raymond A. Serway and Chris Vuille; Cengage Learning; 9th edition; (2011).**

4. List Electronic Materials (e.g. Web Sites, Social Media, Blackboard, etc.)

   - [http://demonstrations.wolfram.com](http://demonstrations.wolfram.com)
   - [http://faculty.mu.edu.sa/salzobaidi](http://faculty.mu.edu.sa/salzobaidi)
   - [http://www.phys.virginia.edu/classes/109N/more_stuff/Applets/ProjectileMotion/jarapplet.html](http://www.phys.virginia.edu/classes/109N/more_stuff/Applets/ProjectileMotion/jarapplet.html)
   - [http://www.ac.wwu.edu/~vawter/PhysicsNet/Topics/Vectors/VectorProducts.html](http://www.ac.wwu.edu/~vawter/PhysicsNet/Topics/Vectors/VectorProducts.html)
   - [http://mathforum.org/~klotz/Vectors/](http://mathforum.org/~klotz/Vectors/)

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

   - Excel software for drawing graphs in the lab.
   - Word office for writing reports.

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 (Classrooms, laboratories, demonstration rooms/labs, etc.)
1 classroom with the capacity of maximum 25 students is required. (available).
1 laboratory with the capacity of maximum 12 students is required (available).

2. Computing resources (AV, data show, Smart Board, software, etc.)

The classroom is equipped with a smart board and its running software ‘active inspire’.
The laboratory is equipped with a smart board and its running software ‘active inspire’.
AV outlets for both classroom and laboratory.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- The statistics obtained from the students final results.
- Student’s survey.
- Holding a general meeting between the faculty members and all students to discuss all kind of problems facing them regarding the teaching process.
- The feedback from the personal interview of the student with his academic advisor.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Complaint box.
- Personal interviews with randomly selected students.

3 Processes for Improvement of Teaching

- Course report.
- Program report.
- Annual refreshing training courses for the faculty members about the best teaching practices.
- The discussion of all teaching difficulties and the methods for improvement at departmental level.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- A committee of maximum three faculty members are assigned for each subject to review the checking of the first, second and final exams.
- An internal revision report is written by the committee for each course.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The feedbacks of the students are studied carefully.
- All feedbacks coming from the teachers of the course will be collected.
- The committee of the curriculum will discuss all feedbacks and modifications needed.
- The final decisions of the committee will then be studied in the department’s council.
- In case of approval it is the job of the committee of the curriculum to proceed with all the paper work needed.

Faculty or Teaching Staff: __Dr. Samir Al-zobaidi__

Signature: __________________________ Date Report Completed: _____12/4/2014_____

Received by: __Dr. Thamer Al-harbi__  Dean/Department Head

Signature: __________________________ Date: _______/4/2014______