



Course Specification for

PHY 498 Research Project

Bachelor of Science in Physics

Department of Physics

College of Science

Al Imam Mohammad Ibn Saud Islamic University



Course Specifications

Institution: Al Imam Mohammad Ibn Saud Islamic University Date of Report: November 20, 2016
College/Department: Science / Physics

A. Course Identification and General Information

1. Course title and code: Research Project, PHY 498																				
2. Credit hours: 2 C.H.																				
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) B. Sc. in Physics																				
4. Name of faculty member responsible for the course: Prof. Dr. Ali S. Hennache																				
5. Level/year at which this course is offered: Level 8/Year 4																				
6. Pre-requisites for this course (if any):																				
7. Co-requisites for this course (if any)																				
8. Location if not on main campus: Main Campus																				
9. Mode of Instruction (mark all that apply)																				
<table border="0"> <tr> <td>a. Traditional classroom</td> <td><input checked="" type="checkbox"/></td> <td>What percentage?</td> <td><input type="text" value="100%"/></td> </tr> <tr> <td>b. Blended (traditional and online)</td> <td><input type="checkbox"/></td> <td>What percentage?</td> <td><input type="text"/></td> </tr> <tr> <td>c. e-learning</td> <td><input type="checkbox"/></td> <td>What percentage?</td> <td><input type="text"/></td> </tr> <tr> <td>d. Correspondence</td> <td><input type="checkbox"/></td> <td>What percentage?</td> <td><input type="text"/></td> </tr> <tr> <td>f. Other</td> <td><input type="checkbox"/></td> <td>What percentage?</td> <td><input type="text"/></td> </tr> </table>	a. Traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="100%"/>	b. Blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>	c. e-learning	<input type="checkbox"/>	What percentage?	<input type="text"/>	d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>	f. Other	<input type="checkbox"/>	What percentage?	<input type="text"/>
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Comments:																				



B. Objectives

1. What is the main purpose for this course?
 - **Make literature review of current state of the art of specific scientific subjects;**
 - **Understand and develop new scientific concept to solve and overcome a real life problem;**
 - **Carry out and accomplish the work described and find solutions to a specific scientific problem;**
 - **Gain research experience and communication skills;**
 - **Able to communicate technical information in written and oral to scientific community;**
 - **Write-up of results and final report.**
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)
 - **Organization of research including: logistics, recording, archiving, numerical analysis and presentation of data, interpretation and presentation of results in the form of a dissertation, develop important skills in summarizing a research area.**
 - **There is a teaching /learning Quality assurance process for minor/major changes in the course based essentially on course reports and students evaluation.**

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

Course Description:

This course (research project) represents the culmination of study towards the Bachelor degree of Science in Physics. It offers the opportunity to apply and extend material learned throughout the program. The course undertaken spans a diverse range of topics, including theoretical, simulation and experimental studies.

Course regulations:

I. Registration requirements

- The research project consists of a report to be prepared only by students who have successfully completed at least 100 credit hours of the bachelor's program. The student is further expected to graduate in the semester of the project preparation or at most in the next summer semester.
- A student cannot register for a research project in the summer semester.

II. General procedure

- The Department committee in charge of research projects first calls for project submissions at the end of the semester preceding projects preparation. Then faculty members submit proposals according to the specific form available.
- The model of the proposed research project indicates whether the project is intended for one student or two students.



- The subject of the proposed research project should be of a scientific nature appropriate to the scientific background of the student. It should require some scientific background covering at least level 6 of BSc syllabus.
- The main objective of a project is to strengthen the scientific background of the student, to develop his/her practical skills, but not to obtain new scientific results.
- The Department committee evaluates project proposals and then publishes the list of accepted projects.
- Each student enrolled in a research project is asked to choose one project from the list.
- The committee reviews the selected projects and assigns to each student one project. In case when two or more students choose the same subject, priority will be given to the student with best grading.
- Teachers and students are then informed about project assignments at most three weeks after semester start.

III. Project Supervision

- Each teacher can supervise at most 2 students.
- The supervisor must meet with his/her student at least two hours per week.
- If the student lacks diligence on his project, the supervisor should submit a detailed report to the Department committee.

IV. Project report

- In the eighth week of the semester, the supervisor must complete a first report on the carried out work, marking it with a score out of 30.
- Two weeks before the final exams start, the supervisor writes down a final report marking it with a score out of 30 (written evaluation). Furthermore, the supervisor checks the plagiarism level of the project. A maximum of 40% is tolerated. Elsewhere, the student must make modifications in his project to fulfill this condition.

V. Project defense

- Before the end of the final exams, the Department committee sets up a timetable for oral defense for all projects in the department.
- The Department committee selects defense panels and sends out copies of projects to defense committee at least two days before the defense date.
- Every member of the committee should make a written evaluation of the project.
- Once the project defense finished, the jury debates and scores the project a mark out of 40. The supervisor reports his overall mark to the chairman of the project committee.



1. Topics to be Covered		
List of Topics In respect of the project aspect of the module, students are expected to :	No. of Weeks	Contact Hours
<ul style="list-style-type: none"> Plan and execute a 16 week project in experimental or theoretical physics in nature (or a mixture of both) and might involve substantial computing, construction and design, theory, measurements, and numerical modeling or analysis. 		
<ul style="list-style-type: none"> Planning report: Project topic selection and accompanying justification. 		
<ul style="list-style-type: none"> Planning report: Proposed project outline. 		
<ul style="list-style-type: none"> Planning report: Project schedule individual or as a team member tasks identified. 		
<ul style="list-style-type: none"> Involve constant review of the plan. 		
<ul style="list-style-type: none"> Setting and meeting deadlines and dealing with changes to the project plan as they arise. 		
<ul style="list-style-type: none"> Weekly reports. 		
<ul style="list-style-type: none"> Interim report. 		
<ul style="list-style-type: none"> Regular interaction and discussion with student's project supervisor and the outcome results and experimentations. 		
<ul style="list-style-type: none"> Undertake a literature review on a topic of relevance to the overall project. 		
<ul style="list-style-type: none"> Deliver a final report presentation , structure and supported appropriate drawings, figures, characteristics curves, experimental equipments and tests, calculations and appendices) and oral presentation of student's project work summarizing the essential scientific and practical aspects and outcomes of the project at the end of semester. 		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact hours						
Credit						2

3. Additional private study/learning hours expected for students per week. For Female section, the private study is given via network	5.5
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#	Teaching/Learning activities	Contact hours	Frequency	Total contact hours	Self-study hours	Total self-study hours	Student learning time
1	Lecture	1	14	14	1	14	28
2	Scientific research	0	14	0	3	42	42
3	Final written project	0	1	0	15	15	15
4	Final written presentation	1	1	1	10	10	11
Total				15		81	96

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

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge At the end of this course, students should be able to:		
1.1	Learn to handle a scientific project.	<ul style="list-style-type: none"> Diversify assessment. Promote skills and employability. Empower the student. Promote links between teaching and research. 	<ul style="list-style-type: none"> Submission weekly report by student to supervisor. Monthly assessment report written by the supervisor. Final oral presentation assessed by examiners committee.
1.2	Learn good project management skills.	<ul style="list-style-type: none"> Weekly 2 hours devoted to project. Address concern. Promote skills and employability. Identify potential research students. 	<ul style="list-style-type: none"> Meeting during office hours to discuss difficulties on the advancements of the project. Submission weekly report by student to supervisor. Monthly assessment report written by the supervisor. Final oral presentation assessed by



			examiners committee.
1.3	Plan and carry out a detailed and original piece of scientific research and communicate the results.	<ul style="list-style-type: none"> • Weekly 2 hours devoted to project. • Promote skills and employability. • Promote links between teaching and research. • Identify potential research students. 	<ul style="list-style-type: none"> • Submission weekly report by student to supervisor. • Monthly assessment report written by the supervisor. • Interactive discussion. • Final oral presentation assessed by examiners committee.
1.4	Develop important skills in summarizing a research area and understanding the research objectives.	<ul style="list-style-type: none"> • Weekly 2 hours devoted to project. • Empower the student • Promote links between teaching and research. • Identify potential research students. 	<ul style="list-style-type: none"> • Meeting during office hours to discuss difficulties on the advancements of the project. • Submission weekly report by student to supervisor. • Monthly assessment report written by the supervisor. • Final oral presentation assessed by examiners committee.
2.0	Cognitive Skills		
	At the end of this course, students should be able to:		
2.1	State an excellent working knowledge of the project theories.	<ul style="list-style-type: none"> • Fairly complete discussion during the office hours with the supervisor. • Self working of student on modeling simulation analysis and interpretation. 	<ul style="list-style-type: none"> • Office discussion and questions. • Evaluation on student's reports and via the website community.
2.2	Reorganize and understand the	<ul style="list-style-type: none"> • Fairly complete 	<ul style="list-style-type: none"> • Office discussion and



	basics properties related to the project.	<p>discussion during the office hours with the supervisor.</p> <ul style="list-style-type: none"> • Self working of student on modeling simulation analysis and interpretation. 	<p>questions.</p> <ul style="list-style-type: none"> • Evaluation on student's reports and via the website community.
2.3	Define and distinguish between different physical phenomena related to project.	<ul style="list-style-type: none"> • Fairly complete discussion during the office hours with the supervisor. • Self working of student on modeling simulation analysis and interpretation. 	<ul style="list-style-type: none"> • Office discussion and questions. • Evaluation on student's reports and via the website community.
2.4	Outline a mathematical modeling related to any physical phenomena and explain and interpret clearly concepts and outcome results.	<ul style="list-style-type: none"> • Fairly complete discussion during the office hours with the supervisor. • Self working of student on modeling simulation analysis and interpretation. 	<ul style="list-style-type: none"> • Office discussion and questions. • Evaluation on student's reports and via the website community.
3.0	Interpersonal Skills & Responsibility		
3.1	Ability to deal with various sources of knowledge and the ability to exploit and to estimate the time.	<ul style="list-style-type: none"> • Motivate the student to investigate related topics that are not covered in details with the supervisors. 	<ul style="list-style-type: none"> • Evaluation of student's advancements and reports.
3.2	Discuss the results with other colleagues and with supervisors.	<ul style="list-style-type: none"> • Motivate the student to investigate related topics that are not covered in details with the supervisors. 	<ul style="list-style-type: none"> • Evaluation of student's advancements and reports.
4.0	Communication, Information Technology, Numerical		
4.1	Develop communication skills by planning, preparing and delivering a verbal presentation, to a professional standard, on their own academic work, making	<ul style="list-style-type: none"> • Upload questions and invite discussion. • Encourage student to use Information and Communication 	<ul style="list-style-type: none"> • Allocate marks continuously for the seriousness of the student in his advancements on the projects.



	effective use of presentation aids, in a professional forum.	Technologies regarding questions, information, submission reports.	<ul style="list-style-type: none"> • Accept reports only if they are submitted using electronic mail and internet network.
4.2	Use of Electronic Mail in communicating with others, colleagues and supervisor.	<ul style="list-style-type: none"> • Upload questions and invite discussion. • Encourage student to use Information and Communication Technologies regarding questions, information, submission reports. 	<ul style="list-style-type: none"> • Allocate marks continuously for the seriousness of the student in his advancements on the projects. • Accept reports only if they are submitted using electronic mail and internet network.
5.0	Psychomotor N. A.		



5. Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes (Use Program LO Code #s provided in the Program Specifications)															
	4.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	4.1	4.2	5.1	5.2	
1.1	✓	✓	✓	✓												
1.2	✓	✓	✓	✓												
1.3	✓	✓	✓	✓												
1.4	✓	✓	✓	✓												
2.1					✓	✓	✓	✓								
2.2					✓	✓	✓	✓								
2.3					✓	✓	✓	✓								
2.4					✓	✓	✓	✓								
3.1									✓	✓	✓					
3.2									✓	✓	✓					
4.1												✓	✓			
4.2												✓	✓			
4.4												✓	✓			
5.0																

6. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	The final year project is compulsory and 100% based on continuous assessment, i.e. it must be passed at the end semester examinations. To ensure that all students have the opportunity to spend time on their project module, irrespective of their other final year module options.	weekly	The final year project is an assessment of performance away from a formal examination.
2	1st Report written by supervisor on the advancement of the student's project.	7th Week	30 %
3	2nd Report written by supervisor on the advancement of the student's project.	13th Week	30 %
4	Final Oral Exam directed by an oral examination committee.	16th Week	40 %



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)
Every student is supervised by an academic staff regarding his project he will receive all the necessities academic and scientific advices which let the student able to design implement and finalize his project.

E. Learning Resources

1. List Required Textbooks
This depends on the project topic.
2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
4. List Electronic Materials (e.g. Web Sites, Social Media, Blackboard, etc.)
www.imamm.org and Project communities.
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

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.)

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

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

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

3. Processes for Improvement of Teaching

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)

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



Authorized Signatures

- *Faculty/Teaching Staff (who prepared the form) :* **The Department Quality Committee**

Signature:

Date: **January 22, 2017**

- *Faculty member responsible for the course:* **Prof. Dr. Ali S. Hennache**
- *Program Chair / Department Head:* **Dr. Ahmed ALkaoud**

Signature:

Date: **January 22, 2017**