



Course Specifications

Course Title:	Research Skills in Physics
Course Code:	PHY4801
Program:	Physics
Department:	Physics
College:	Applied Science
Institution:	Umm Al-Qura University

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A. Course Identification

1. Credit hours: 4
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: Level 12 th / 4 th year
4. Pre-requisites for this course (if any): Department Approval
5. Co-requisites for this course (if any):

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	20	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	20
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	20

B. Course Objectives and Learning Outcomes

1. Course Description This course covers the basis of research methods in physics, such as, definition and objectives of research, types of research, various steps in research process, data collection, types of theses, and ethics in research.
2. Course Main Objective At the end of this course, the student will be able to <ul style="list-style-type: none">- Define the scientific research.- Differentiate between the different types of scientific research.- List the various steps in research process.- Differentiate between the different types of theses.- Communicates scientific research orally and in writing.



3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Define the basic concepts of scientific research, type of research, various steps in research process, type of thesis, and ethics in research.	K1
1.2	List the various steps in research process.	K1
2	Skills :	
2.1	Apply Physics law to solve some problems using suitable research methods.	S1
2.2	Demonstrate knowledge of basic research orally and in writing	S2
3	Values:	
3.1	Apply standards of integrity and ethics in all tasks	V1
3.2	Collaborate and contribute responsibly and effectively in teamwork	V2

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Research Methodology	2
2	Definition and objectives of Research	2
3	Types of research	2
4	Various Steps in Research Process	2
5	Developing a research question - Choice of a problem	2
6	Data collections	2
7	Types of theses	2
8	Academic Writing	2
9	Ethics in research	2
10	How to give an oral presentation	2
Total		20

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Define the basic concepts of scientific research, type of research, various steps in research process, type of thesis, and Ethics in research.	1. Demonstrating the basic principles through lectures. 2. Discussing phenomena with illustrating pictures and diagrams. 3. Lecturing method: Board, Power point. 4. Discussions 5. Brain storming	- Discussions during the lectures - Exams: a) Quizzes. b) Midterm exams. c) Final exam.
1.2	List the various steps in research process.		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.0	Skills		
2.1	Apply Physics law to solve some problems using suitable research methods.	1. Preparing main outlines for teaching. 2. Define duties for each chapter	1. Exams: a) Quizzes. b) Midterm exams. c) Final exam 2. Homework.
2.2	Demonstrate knowledge of basic research orally and in writing		
3.0	Values		
3.1	Apply standards of integrity and ethics in all tasks	<ul style="list-style-type: none"> Organize the students in a small groups (teamwork). Give students tasks of duties as a small project. 	<ul style="list-style-type: none"> Evaluate the scientific reports. Discussing the reports with each teamwork. Evaluate the efforts of each student in preparing the report.
	Collaborate and contribute responsibly and effectively in teamwork		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm Exam	8 th	30%
2	Homework's & Quizzes	All weeks	20 %
3	Final Exam	End of the semester	50%
4			

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

Each student will be supervised by academic adviser in Physics Department and the time table for academic advice were given to the student each semester. (4 hrs per week)

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ul style="list-style-type: none"> C. George Thomas, "Research Methodology and Scientific Writing", 2nd Edition, Springer (2021)
Essential References Materials	<ul style="list-style-type: none">
Electronic Materials	



Other Learning Materials	
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2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	- Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	- Black Board - Data show
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching Strategies	Students	Questionnaire
Effectiveness of student assessment	Instructor	Exams
Extent of achievement of course learning outcomes	Instructor	Course report
Quality of learning resources	Instructor	Course report

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

