المركز الوطني للتقويم والاعتماد الاكاديمي
National Center for Academic Accreditation and Evaluation

ATTACHMENT 5.

T6. COURSE SPECIFICATIONS (CS)

هيئة تقويم التعليم
Education Evaluation Commission

Course Specifications

Institution: University of Tabuk	Date: 16/04/2019
College/Department : Faculty of Science, Department of Physics	

A. Course Identification and General Information

1. Course title and code:Theoretical Methods (2), PHYS-352
2. Credit hours: 4
3. Program(s) in which the course is offered. Bachelors
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: Dr. Muhammad Sadiq
5. Level/year at which this course is offered: Year 2
6. Pre-requisites for this course (if any):PHYS-251
7. Co-requisites for this course (if any):
8. Location if not on main campus:
9. Mode of Instruction (mark all that apply):

a. traditional classroom	✓	What percentage?	100
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?
To equip students with the necessary mathematical tools useful in many areas of physics

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)
The black board is enough tool for the subject.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:
The course is designed to enhance the mathematical skills of the student in order to enable them to work in any advanced course of physics, especially in quantum mechanics. The following topics are planned to be covered at length.

Special functions of mathematical physics, Hermite polynomial, Legendre and associated Legendre polynomials, Laguerre and associated Laguerre polynomials, Bessel and spherical Bessel functions and their important properties. Fourier series, Fourier and Laplace transforms and their simple applications. Elements of probability theory, random variables, expectation values, probability distributions. Elements of group theory

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Special functions of mathematical physics		4
Hermite polynomial		4
Legendre and associated Legendre polynomials		5
Laguerre and associated Laguerre polynomials		5
Bessel and spherical Bessel functions and their important properties		5
Fourier series		5
Fourier and Laplace transform and their simple applications		6
Elements of probability		3
Random variables		3
Expectation values		3
Probability distributions		4
Elements of group theory		5

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

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	52				4	56
	Actual	44				4	48
Credit	Planed	4					4
	Actual	4					4

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

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

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. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Have a clear background of mathematical tools useful in many fields of physics	Lecture	Exam/Quiz/HW
1.2	Have a knowledge of the fundamentals of special functions, various polynomials, Fourier series, Fourier and other integral transforms, probability theory and group theory, etc.	Lecture	Exam/Quiz/HW
2.0	**Cognitive Skills**		
2.1	Have enough background knowledge to join advanced courses in any field of physics	Lecture	Exam/Quiz/HW
2.2	Acquire a working knowledge of mathematical machinery useful in physics	Lecture	Exam/Quiz/HW
3.0	**Interpersonal Skills & Responsibility**		
3.1	Be able to do mathematical calculations	Lecture	Exam/Quiz/HW
3.2	Quickly reflect on any mathematical	Lecture	Exam/Quiz/HW

	problem		
4.0	**Communication, Information Technology, Numerical**		
4.1			
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exam1	7	25%
2	Exam2	13	25%
3	Final Exam	15	40%
4	Homework and Quiz	1-12	10%
5			
6			
7			
8			

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) There is one office hour for each lecture in which students can discuss their individual problems regarding the lesson. However, the students could consult the teacher in other suitable times.

E Learning Resources

1. List Required Textbooks Introduction to Mathematical Physics, by Charlie Harper; Prentice-Hall, 4th Edition.
2. List Essential References Materials (Journals, Reports, etc.) i) Introduction to Mathematical Physics: Methods and Concepts: by Chun WaWong (1991) ii) Mathematical Methods for Physicists, by G.B. Arfken, and H.J. Weber; Academic Press (1995)
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
4. 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.) Classroom
2. Technology 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 Online questioner/survey
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Visit the department and classes
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) External examiner
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. Review the course report

Name of Course Instructor:Dr. Muhammad Sadiq Rozab

Signature: Sadiq Date Specification Completed: 16/04/2019

Program Coordinator: Dr. Fahad Alharbi
Signature: Dr. Fahad Alharbi Date Received: 19/4/2019