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: 18-4-2019
College/Department :Physics, science	

A. Course Identification and General Information

1. Course title and code: statistical, **PHYS 451**
2. Credit hours: 3hour
3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course **Dr. Ali Hatem LAATAR**
5. Level/year at which this course is offered: 7 , year 4
6. Pre-requisites for this course (if any):PHYS 251
7. Co-requisites for this course (if any): none
8. Location if not on main campus: 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?

The purpose of the course is that the student shall develop knowledge and basic skills to write structured programs in modern programming languages and to use numerical methods for modeling and solving physical systems.

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)

1. Update the content periodically.
2. Using new references.
3. Using web references.
4. Increase the use of electronic reference documents.
5. Increase the use of recent overhead projectors and electronic screens for teaching
6. Content following the latest research in the field

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

Course Description:
The course will introduce the Fortran language as well as the basic Numerical methods.
Introduction to FORTRAN, Elements of program, identifier, keywords, data types, Declaration, Operators, Control, loops, Arrays, FORTRAN functions, Routines.
Computational Numerical methods: interpolation, differentiation, integration, differential equations, Monte Carlo simulation.

List of Topics	No of Weeks	Contact hours
Introduction to computer and programming – binary coding	1	3
Introduction to Fortran programming, commands and statements. Variable types and declarations	2	3
Input and output functions - Reading and writing formatted quantities.	3	3
Arithmetic and logical Operators and expressions- Control statements Tests- Simple IF statement - IF ELSE statement-nested IF ELSE	4	3
Revision and first midterm exam	5	3

Loops DO and DOWHILE statements	6	3
Vector, matrix, and array functions.	7	3
Intrinsic procedures, subroutines and functions. External files and output formatting.	8	3
Interpolation: Newton's forward, backward and divided difference formula, Lagrangian interpolation formula	9	3
Differentiation: Forward, Backward and Central difference formulas	10	3
Revision and second midterm exam	11	3
Integration: Newton-Cotes - The Trapezoidal Rule -The Simpson's Rule	12	3
Differential equations: Euler's Method - Runge-Kutta method - Linear multistep methods	13	3
Monte Carlo simulation.	14	3
General Revision	15	3

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

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	45 hr					45 hr
	Actual	45 hr					45 hr
Credit	Planed	3					3
	Actual	3					3

3. Additional private study/learning hours expected for students per week. 6 hr

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	Demonstrate sound knowledge of the role that computing can play in solving scientific problems	• Lecturing • interactive Discussion • working out problems • Homework • Revision	• Homework. • Quiz • Presentation • Mid-term exam • Final test • Surveys
1.2	Demonstrate sound knowledge of the basis of a modern programming language (FORTRAN).		
1.3	Demonstrate sound knowledge of the basic principles of computational numerical methods		
2.0	**Cognitive Skills**		
2.1	Students will be able to manipulate computers	• Problem solving • Class discussion • Presentation • Individual meeting with the instructor	• Class Participation • Case study • Presentation • Essay Question • Research • Surveys
2.2	Students will be able to compile scientific programs using a computer language.		
2.3	Students will be able to solve some physics problems by using numerical approximations.		
2.4	Students will be able to implement different data types.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Demonstrate the ability to learn independently using a variety of media	• Discussion with students • Making students aware about time management in completing their assignments and projects. • Counsel students how to make a good presentation • Encourage students to help each other • Group presentation	• Respecting deadlines. • Showing active class participation. • Helping other students to understand tasks in the class. • Giving clear and logical arguments • Performing seriously on midterms and final exams
3.2	Demonstrate time management and organizational skills		
3.3	Work successfully in a group		
3.4	Commit ethically and consistently with high moral standards in personal and professional relationship		
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicate ideas concisely and accurately using written and oral means.	• Exercises • Problem solving	• Write reports • Presentation
4.2	Use appropriate scientific software		

4.3	Use of information technology and computer tools to solve physics problems	• oral quizzes • Essay questions • Encourage students to use program software	• Exercises related to specific topics
5.0	**Psychomotor**		
	NA		

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	Student's participation, homework assigned questions, and evaluation	15	10%
2	- Two midterm tests	6 and 12	25%
3	- Final examination (40%).	16	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) - Students can approach during the office hours for the faculty member to ask questions to clarify some points missed during the lecture. - Students can communicate with the teaching staff through the website and ask questions related to all aspects of the lesson. - The teaching staff are available during all the day, where they are ready to clarify any points related to the course.

E Learning Resources

1. Required Text(s):
2. Essential References 1- Brief Introduction to the Fortran 90 programming language Anders W. Sandvik, Department of Physics, Boston University
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4-.Electronic Materials, Web Sites etc 1-http://physics.bu.edu/~py502/lectures1/f90.pdf 2- Tutorial by C. K. Shene, Michigan Technological University List of intrinsic functions in Fortran 90
5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) - Classrooms ready and equipped with educational media
2. Computing resources - Data show and internet.
3. Other resources (specify --eg. 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** - Regular evaluation of the theoretical and practical parts of the course to identify the weaknesses areas - Performance appraisal form filled up by each student to show level of fulfilment - Confidential completion of standard course evaluation questionnaire
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department - A statistical regular review and analysis of the students achievement in the department. - Prepare a questionnaire which should be filled by the students at the end of the term. The questionnaire should be after that analyzed and carefully studied.
3 Processes for Improvement of Teaching - Provide training and workshop opportunities for the teaching staff to improve their teaching strategies. - Form committees to follow up progress and work on improvement. - Provide opportunities to improve academic courses and research through conferences. - Provide the teaching staff members with all the references and electronic resources. - Updating through more reading books and articles related to the course - Improve relations between instructor and students.
4. Processes for Verifying Standards of Student Achievement (eg. 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) - Check marking of the answer sheets of examination papers with other colleagues - Check progress level of the students (this can be done by an independent teacher by reviewing students' records and compare the students work with another from a different institute).
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. - Student's, Alumni's and Employer's feedbacks on the quality of the course.

- Consulting other faculty members or collaborators in overseas universities for their views on the method of quality of improvement
- Check other universities web sites to compare our lectures with them
- Compare the syllabus with the syllabus of standard universities.
- Form a specialized committee from the department to review the progress of teaching and update the resources
- Consult distinguished students and discuss with them positive and negative points in Lectures.

Name of Course Instructor: **Dr. Ali Hatem LAATAR**

Signature: _____ Date Specification Completed: 18-4-2019

Program Coordinator: __ Dr. Fahad Alharbi _____
Signature: Dr. Fahad Alharbi Date Received: 20/4/2019