Ministry of Higher Education and Scientific Research

Supervision and Scientific Evaluation Body

Quality Assurance and Academic Accreditation Office

Course Description Sample

Subject: advanced mathematics and numerical method

This course description provides a brief survey of the most important characteristics, expected learning output, showing whether students have made full use f the learning opportunities. These characteristics have to be matched with the description of the program.

1. Educational Institution	Shatt Al-Arab University College
2. Department / Center	Computer science
3. Course Title /Code	advanced mathematics and numerical method
4. Lecturer Name	Nafea ali majeed alhammadi
5. Type of Teaching	Attendance
6. Academic Year /Term	2022-2023
7. Total No. of Teaching Hours	60 hours
8. Date f Preparing this Course Description	29/9/2022

9. **Course Objectives**

a. Providing students with the most important principles and basics of advanced mathematics and numerical method
b.Teaching students how to apply advanced mathematics and numerical method
c. Providing graduates with the necessary knowledge on advanced mathematics and numerical method job in organizations.
d. Improving the administrative skills in the field of advanced mathematics and

numerical method
e. Providing graduates with the skills of education and creative learning.

10. **Course Output, Methodology and Evaluation**

(A) **Cognitive Objectives**

a. Enabling students to acquire knowledge and the art of advanced mathematics and numerical method
b. Acquainting students with how to promote their personal knowledge.
c. Helping students to acquire knowledge in the art of advanced mathematics and numerical method
d. Enabling students to sharpen their skills in the dynamic work environment.
e. Enabling students to invest their scientific abilities in their working place in the scope of advanced mathematics and numerical method
f. Helping students to get the necessary knowledge to solve problems advanced mathematics and numerical method

(B) **Skill Objectives Related to the Program**:

a. Scientific Skills
b. Leadership Skills
c. Skills Related to Administrative Work Challenges

Methods of Teaching and Learning

a. Using already- prepared lectures.
b. Using up-to-date data shows.
c. Homework
d. Adopting group discussions.

Methods of Evaluation

a. Oral tests
b. Monthly tests
c. Daily quizzes
d. Students' Regular Attendance

(C) **Sentimental and Value Objectives**

a. Realizing ethical objectives.
b. Commitment to university traditions.
c. Compliance with the University Instructions and the Ministry Regulations.
d. Promoting students' personal abilities in educational scopes and how to behave well with others.

Methods of Teaching and Learning

a. Lectures on university instructions.
b. Educational guidance lectures.
c. Continuous directing.
d. Visiting State and private institutions.
e. Showing practical cases.

Methods of Evaluation

a. Daily quizzes.
b. Classroom discussions and commitment to ethics and sublime values.
c. Special marks for class activities.
d. Monthly and quarterly evaluation.

D) **General and Qualitative Skills (other skills related to the ability of employment and personal development)**

a. Enabling students to acquire the skill and art of advanced mathematics and numerical method
b. Enabling students to apply creative thinking in advanced mathematics and numerical method
c. Enabling students to use modern methods of analysis and conclusions.
d. Enabling students to advanced mathematics and numerical method

11. **Course Structure**

Week	No of Hours	Required Learning Output	Title of Subject	Teaching Method	Evaluation
1	2	understanding the material	**Differential equations1**	- lectures - case study -discussions	- oral tests -questions
2	2	understanding the material	**Differential equations2**	- lectures - case study -discussions	- oral tests -questions
3	2	understanding the material	**Differential equations3**	- lectures - case study -discussions	- oral tests -questions
4	2	understanding the material	**Differential equations4**	- lectures - case study -discussions	- lectures - case study -discussions
5	2	understanding the material	**Differential equations5**	- lectures - case study -discussions	- lectures - case study -discussions
6	2	understanding the material	**Special function gamma**	- lectures - case study -discussions	- lectures - case study -discussions
7	2	understanding the material	**Special function beta 1**	- lectures - case study -discussions	- lectures - case study -discussions
8	2	understanding the material	**Special function beta 2**	- lectures - case study -discussions	- lectures - case study -discussions

9	2	understanding the material	**Special function beta 3**	- lectures - case study -discussions	- lectures - case study -discussions
10	2	understanding the material	**Special function beta 4**	- lectures - case study -discussions	- lectures - case study -discussions
11	2	understanding the material	**Special function error**	- lectures - case study -discussions	- lectures - case study -discussions
12	2	understanding the material	**Fourier series**	- lectures - case study -discussions	- lectures - case study -discussions
13	2	understanding the material	**Fourier transforms**	- lectures - case study -discussions	- lectures - case study -discussions
14	2	understanding the material	**Fast fourier transforms**	- lectures - case study -discussions	- lectures - case study -discussions
15	2	understanding the material	**Binary fractions and shifting**	- lectures - case study -discussions	- lectures - case study -discussions

Scientific notation			
Machine numbers and computer accuracy			
Computer floating point numbers			
Error analysis			
Linear systems			
Non-linear equation			
Interpolation and polynomial approximation			
Numerical differentiation			
Numerical integration			
Solution of differential equations			
Eigen values			
Eigen vector			
Uelar equation			
مراجعة			
التهيئة للامتحان			

12.**Infrastructure**

a. Textbooks	**Thomas,g,"calculas and analytic geometry 5 , thedition.addison wesly,2.mathews.j.h(1999),"numerical methods using matlab"prentice hall**
b. References	

c. Recommended books and periodicals (journals, reports, etc.)	
d. Electronic references, internet websites, etc	

13. **The Plan of Improving the Course**

a. Studying labor market needs.
b. Be informed of the experiences of other countries in the field of advanced mathematics and numerical method
c. Be informed of research work published in national and international journals in the field of advanced mathematics and numerical method