The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	**Mathematical Physics-2**
2	Course number	**0332282**
3	Credit hours (theory, practical)	3 credit hours
	Contact hours (theory, practical)	
4	Prerequisites/corequisites	Mathematical Physics-1 (**0302281**)
5	Program title	B.Sc. in Physics
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Science
9	Department	Physic
10	Level of course	Second year level
11	Year of study and semester (s)	2016-2017, second semester
12	Final Qualification	Bachelor degree
13	Other department (s) involved in teaching the course	No other department
14	Language of Instruction	English
15	Date of production/revision	30 Jan 2017

16. Course Coordinator:

Office numbers 303
office hours Sunday 10:00-11:00 and Monday 10:00-11:00
phone numbers Ext. 22066
email addresses *alaa.azzam@ju.edu.jo*

17. Course Description:

Coordinate Transformations; tensor analysis; gamma; beta and error functions; asymptotic series; Stirling's formula; elliptic integrals and functions; integral transforms; series solution of differential equations; Legendre polynomials; Bessel functions; set of orthogonal functions; partial differential equations; functions of a complex variable.

18. Course aims and outcomes:

A- Aims:
To meet the course description
B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to …

1. Define the tensor and specify its properties, and to use it in some physical applications.

2. Define the special functions such as gamma and beta functions, and to be apple to use them in some physical problems.

3.   use the asymptotic series in some applications and to specify their properties.
4.   use Stirling's formula.
5.   apply the elliptic integrals in solving problems and to use the elliptic functions.
6.   Use the integral transformations and to apply them in solving some problems.
7.   use the series solution of differential equations
8.   identify the Legendre polynomials and to use them.
9.   use the Bessel functions
10. identify the orthogonal functions
11. solve the partial differential equations
12. solve functions of complex variables.

20. Topic Outline and Schedule:

Topic*	Week	Achieved ILOs*	Reference
tensor analysis	1&2	1	chapter 10
gamma function	3	2	chapter 11
beta function	4	2	chapter 11
error function	4	2	chapter 11
asymptotic series	5	3	chapter 11
Stirling's formula	5	4	chapter 11
elliptic integrals and functions	6	5	chapter 11
integral transforms	7	6	chapter 7 section12 and chapter 8 section 8
Legendre polynomials	8&9&10	7&8&10	chapter 12
Bessel functions	11&12	7&9&10	chapter 12
partial differential equations	13&14	11	chapter 13
functions of a complex variable	15&16	12	chapter 14

*The methods of evaluation for achieving the ILO's are by quick quizzes and homework in addition to the exams

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following <u>teaching and learning methods</u>:
the teaching method will be by explaining things on the board in the class and solving examples.

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following <u>assessment methods and requirements</u>:
the evaluation methods will be by giving quick quizzes and homework in addition to the exams

23. Course Policies:

A- Attendance policies:

According to the university rules any student exceeds the allowed number of absence, will be divested from continuing the course .

B- Absences from exams and handing in assignments on time:

The student will get zero until he/she provide official excuse.

C- Health and safety procedures:

No need

D- Honesty policy regarding cheating, plagiarism, misbehaviour:

The university rules will be applied in this case

E- Grading policy:

First exam: 20

Second Exam: 20

assignments and quizzes: 10

Final Exam: 50

F- Available university services that support achievement in the course:

books at the library

24. Required equipment:

computer and data show

25. References:

A.   Required book (s), assigned reading and audio-visuals:
Mathematical Methods in the physical sciences, Mary L. Boas, third edition,Wiley

B.   Recommended books, materials, and media:
1. **Mathematical Methods for Physics and Engineering by Riley, Hobson and Bence.**
2. **A course on mathematical physics by Szekeres.**

Name of Course Coordinator: **Dr. Ala'a Azzam**   Signature: Date: 12 Feb 2017

Head of curriculum committee/Department: -----------------------   Signature: -------------------------------

Head of Department: ------------------------   Signature: -------------------------------

Head of curriculum committee/Faculty: -----------------------   Signature: -------------------------------

Dean: -- -   Signature: -------------------------------

<u>Copy to:</u>
Head of Department
Assistant Dean for Quality Assurance
Course File