Course Specification (2016/2017)
Mathematical Principles 103

A- Basic Information

Course Title	Mathematical Principles
Course Code	103
Program on which the course is given	Bachelor degree of Pharmacy
Academic Year	2016 – 2017
Academic level	First
Semester	Fall
Pre-Requisite	None
Course Delivery	**Credit hours :** 2 Lecture: 2 Practical: -- Total: 2
	Total contact hours per week: 2 Lecture:2 Practical: -- Total:2
Parent Department	Organic Chemistry
Course Coordinator	Dr. Mohamed Husien Eid
Teaching Staff	Dr. Mohamed Husien Eid
Date of Approval	**9/2015**

B- Professional Information

1. Course aims

Provide the student with essential information and fundamentals of Calculus and Algebra and their applications in pharmacy. Also, teach the students differentiation and integration of functions and algebra of matrices and apply mathematical techniques in Dilution problems, Drug analysis and Drug design.

2. Intended learning outcomes (ILOs)

a- Knowledge and understanding:

By the end of the course, the students should be able to:

a.1 Define the polynomials, trigonometric, exponential, logarithmic functions.
a.2 State the concepts of limits, derivative and integral of functions.
a.3 Explain the mathematical operations of matrices.
a.4 Recognize the types of solutions of linear systems.
a.5 Describe the matrix of a chemical compound.

b- Intellectual skills

By the end of the course, the students should be able to:

b.1 Deduce the derivative of trigonometric exponential, logarithmic functions and Polynomials.
b.2 Determine the maximum and minimum values of functions.
b.3 Identify the eigenvalues and eigenvevtors of matrices.
b.4 Verify the Hamilton's equation of a square matrix.

c- Professional and practical skills

By the end of the course, the students should be able to:

c.1 Apply the concepts of functions for discuss the rate of change of concentration of drug in the blood.
c.2 Find the solution of linear system.
c.3 Solve the Dilution problem.
c.4 Perform the algebraic operations of matrices.

d- General and transferable skills

By the end of the course, the students should be able to:

d.1 Demonstrate numerical skills.
d.2 Use information technology for obtaining information.
d.3 Work in a group and lead a team.
d.4 Conduct self learning.

3. Course contribution in the program ILO's

Course ILO's	Program ILO's
Knowledge and understanding	**A1**
Intellectual skills	**B1**
Professional and practical skills	**C13**
General and transferable skills	**D4,D5,D6**

4. Contents

Week	Topic	Contact hours		
	Theoretical	Practical	Lecture	Lab. class
1	Introduction and basic concepts	--	2	--
2	Elementary functions : polynomials, exponential, logarithmic, trigonometric.	--	2	--
3	Derivative, Maximum and minimum values	--	2	--
4	Integral, Methods of integration.	--	2	--
5	Definite integral, Drug analysis.	--	2	--
6	**Mid-term exam**			
7	**Mid-term exam**			
8	Rate of change of drug in the blood.			
9	Matrices and Algebra of matrices.	--	2	--
10	Eigenvalues and eigenvectors.	--	2	--
11	Linear systems.	--	2	--
12	Dilution problem.	--	2	--
13	Curve fitting.	--	2	--
14	Energy levels of chemical compounds.			
Total contact hours			24	--

5. Teaching and learning methods

a. Lectures (√)
b. Laboratory classes (--)
c. Tutorial (--)
d. Class Activity: Discussion and Assignments : (√)

6. Student Assessment

Assessment Method	Schedule	Weight of assessment	
		Mark	%
Written Examination	Quizzes: Weeks 3, 9 Mid-term: Week 6th ,7th Final: Week 16	10 20 60	10 20 60
Practical Examination		--	--
Oral assessment		--	--
Semester activity	Assignments : 2nd , 12th	10	10
Total		100	100

7. Facilities required for teaching and learning

- **Class rooms.** √
- **Computers.** √
- **Laboratory facilities.**
- **Internet.**
- **Projectors (Overhead, video projector)** √

8. Course Plan and ILOs Matrix

Week	Topic	Contact hours		Course ILOs				Teaching and Learning methods			Student Assessment			
	Theoretical	Lec.	Lab.	K & U	I	P	G	Lecture	discussion	Problem solving	W.E	P.E	O.E	C.A
1	Basic concepts	2	--	a1, a2	b1			√	√					√
2	Elementary functions : polynomials, exponential, logarithmic, trigonometric.	2	--		b1, b2			√	√		√			√
3	Derivative, Maximum and minimum values	2	--	a1				√		√	√			√
4	Integral, Methods of integration.	2	--			c1		√		√	√			√
5	Definite integral, Drug analysis.	2	--	a3	b4	c4		√	√	√	√			√
6	**Mid-term exam**													
7	**Mid-term exam**													
8	Rate of change of drug in the blood.	2	--		b3		d1	√	√		√			√

9	Matrices and Algebra of matrices.	**2**	--	a4		c2		√			√			√
10	Eigenvalues and eigenvectors.	**2**	--			c3		√			√			√
11	Linear systems.	**2**	--			c1		√			√			√
12	Dilution problem.	**2**	--	a5			d2	√	√		√			√
13	Curve fitting.	**2**	--	a1		c1	d3	√			√			√
14	Energy levels of chemical compounds.	**2**	--	a3		c4	d4	√	√		√			√
Total contact hours		**24**												

Key:
K & U: Knowledge & Undrstanding
I: Intellectual skills
P: Professional and Practical skills
G: General & Transferable skills
W.E: Written Exam
P.E: Practical Exam
O.E: Oral Exam
C.A: Class Activity
Examples for teaching and learning methods (lectures, presentation, movies, discussion, seminars, tutorials, problem solving, laboratory classes, researches, reports, case studing, etc…)

9. List of references

Course notes

Mohamed Husien Eid , "Lectures In Mathematics For Pharmacy Students", 2015.

Essential books (text books)

Frank Ayres, Jr. and Elliott Mendelson, "Calculus, 5th Edition", Schaum's Series, New york, 2009.

Recommended books

W. Keith Nicholson, "Linear Algebra With Applications", 3rd Edition, PWS Pub. Company, Boston, 1995.

Periodicals, Websites, etc

www.intmath.com www.thomsonrights.com

Course coordinator:

Name: Dr. Mohamed Husien Eid	**Signature:**

Head of Department:

Name:Prof.Dr.Hamdy Ragab	**Signature:**