SECOND SEMESTER 2020-21
COURSE HANDOUT

Date: 14.03.2021

In addition to Part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course Number **: BITS F114**
Course Title **: General Mathematics II**
Instructor-In charge **: TRILOK MATHUR**

1. Course Description:

I. Polar coordinates, Function of several variables, multiple integrals, Vector valued functions.
II. Complex functions and their analyticity.
III. First order and second order ordinary differential equations, Laplace transformations and how to solve initial value problems of ordinary differential equations.

2. Scope and Objective of the Course:

The course is for Pharmacy students keeping in mind the importance of Calculus and Differential equations in every branch of Science and Engineering. Functions of several variables appear more frequently in scientific problem than functions of a single variable. Their derivatives are more interesting because of the different ways in which the variables can interact, while differential equations of both homogeneous and non-homogeneous also plays a vital role in Engineering and Sciences.

3. Text Books:

T_1-For module 1-4: Thomas, Weir, M.D., and Hass, J.: Thomas Calculus, 14th Edition, Pearson Education.

T_2-For module 5-8: Kreyszig: Advanced Engineering Mathematics, Wiley-India.

4. Reference Book:

Stewart, J. (2009): Calculus with Early Transcendental Functions, 1st Edition, Cengage learning.

5. Course Plan:

Module No.	Lecture Session	Reference	Learning Outcomes
1	**Lecture 1-2:** Vector valued functions and Space curve	13.1 (T_1)	Difference between real valued and vector valued functions
2.	**Lecture 3-5:** Introduction to polar co-ordinates, Relation between Cartesian and polar, Polar curves (without sketching)	11.3-11.4 (T_1)	Understanding the Polar co-ordinate system and its advantages
3.	**Lecture 6-14:** Function, Limit, Continuity, Partial derivatives, Chain rule, Directional derivatives, Extreme values and Saddle point,	14.1-14.8 (T_1)	Study of the calculus of function of several variables,

4.	**Lecture 15-17:** Double integral	15.1-15.2 (T_1)	Set & evaluate double integrals
5.	**Lecture 18-22:** Complex number, root and functions, Derivative and Cauchy Riemann equations and Analyticity	13.1-13.4 (T_2)	Difference between Analytic and differentiable function
6.	**Lecture 23-27:** Introduction (Degrees and Order), Linear first order ordinary differential equations, Linear differential equations, Separable and Exact ordinary differential equations	1.1-1.4 (T_2)	How to solve the first order Ordinary differential equation
7.	**Lecture 28-33:** Second order linear homogeneous Ordinary differential equations, Cauchy-Euler Ordinary differential equations, non-homogeneous Ordinary differential equations.	2.1-2.3, 2.5, 2.7 (T_2)	Solution of the second order ordinary differential equations
8.	**Lecture 34-37:** Laplace transformations, Solutions of initial value problems through Laplace transformations	6.1-6.7 (T_2)	Solutions of Ordinary differential equations and Laplace Transformation

6. Evaluation Scheme:

Component	Duration	Weightage %	Date & Time	Nature of component
Mid-Semester Exam	90 Min	30	To be announced later	Open book
Quizzes (2) and Assignments (2)	30 Min for each quiz	30	30/3 (Q-1), 13/4 (A-1) 18/5 (Q-2), 1/6 (A-2)	Open book
Comprehensive Exam	120 Min	40	21/6, 3.00- 5.00 PM	Open book

7. Chamber Consultation Hour: To be announced in the class.

8. Notices: All announcements in relation to the above course will be put up on Nalanda.

9. Make up: Prior permission must be taken in advance for makeup of all components.

Instructor In-Charge
BITS F114