****

**SECOND SEMESTER 2022-2023**

**COURSE HANDOUT (Part II)**

**Date: 13/02/2023**

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*** **:** **Rohit Gupta**

1. **Scope and Objective of the Course:** The course is made 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 Science 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. This course includes Polar Co-ordinates, Functions of several variables, Multiple Integrals, Vector Valued functions, Complex functions and Ordinary differential equations.
2. **Text Books:**

For Topic I: J. Hass, C. Heil, M. D. Weir, Thomas’ Calculus, Pearson education 14th Ed, 2018.

For Topic II and III: Erwin Kreyszig- Advanced Engineering Mathematics, 10th Edition Wiley-India, 2011.

1. **Reference Books:**

James Stewart- Calculus, 5e, Cengage learning, 2003.

Grewal, BS., Higher Engineering Mathematics, 40th Edition, Khanna Publishers, 2007.

1. **Course Plan for General Mathematics II:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Lect. No.** | **Broad Topic** | **Learning objectives** | **Sub-topics to be covered** | **Article** |
|  |  | | I | |
| 1-2 | Polar co-ordinates | How to obtain length of a polar curve and area of a surface of revolution of a polar curve? | Introduction to PC- Relation between Cartesian and polar, Polar curves (without sketching) | 11.3-11.4 |
| 3-13 | Function of several variables | Mathematical definition of a local Maximum and Minimum. Use of chain rule. Relevance to the discipline | Function, Limit, Continuity, Partial derivatives, Chain rule, Directional Derivative, Extreme values and Saddle point, Lagrange Multipliers | 14.1-14.5  14.7-14.8 |
| 14-16 | Multiple Integrals | How formula for area in polar coordinates can be found through polar double integral? | Double integral, Double integral in polar form | 15.1- 15.3 |
| 17-18 | Vector valued functions | Appreciate the concepts of vectorial representation | Vector valued functions and Space curves | 13.1 |
|  |  | | II | |
| 19-25 | Complex functions and their analyticity | Mathematical definitions of complex valued functions | Complex number, root and functions, Derivative and CR equations and Analyticity | 13.1-13.4 |
|  |  | | III | |
| 26-29 | First and Second order differential equations | Learning to develop basic mathematical modelling | Introduction (Degrees and Order), Linear first order ODE, Linear differential equations, Separable and Exact ODE | 1.1,1.3,1.4 |
| 30-36 |  | Learning to develop higher level of mathematical modelling | Second order linear homogenous ODE, Cauchy-Euler ODE, NON-homogenous ODE | 2.1-2.2, 2.5, 2.7 |
| 37-42 | Laplace transformations | A different tool to solve the mathematical models. | Laplace transformations, Solutions of ODE using Laplace transformations | 6.1-6.6 |

1. **Evaluation Scheme:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl. No.** | **Evaluation Component** | **Duration** | **Weightage**  **(%)** | **Date and Time** | **Nature of Component** |
| 1 | Quiz-I | To be announced | **10** | To be announced later | **Open book** |
| 2 | Mid-semester Exam | 90 minutes | **30** | 01/05 9.30 - 11.00AM | **Closed book** |
| 3 | Assignment | To be announced | **10** | To be announced later | **Open book** |
| 4 | Quiz-II | To be announced | **10** | To be announced later | **Open book** |
| 5 | Comprehensive Exam | 180 minutes | **40** | 06/07 AN | **Closed book** |

**The total marks of all the components, taken together will be 100.**

1. **Announcements:** All announcements in relation to the above course will be put up in CMS.
2. **Make up policy:** Make up for the mid-semester/comprehensive examination will be given to genuine cases.

8. **Chamber consultation hours:** To be announced in the class.

9. **Academic Honesty and Integrity Policy**: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

**Instructor In-Charge**

**BITS FII4**