हिमाचल प्रदेश केंद्रीय विश्वविद्यालय
Central University of Himachal Pradesh
(Established under Central Universities Act 2009)
शाहपुर परिसर, शाहपुर, ज़िला काँगड़ा (हि.प्र.) - 176206
Shahpur Parisar, Shahpur, Distt. Kangra (HP) - 176206
Website: www.cuhimachal.ac.in

Course Name: Partial Differential Equation and Integral Equations

Course Code: MTH 408

Credits: 02

Course Instructor: Dr. Kranti Kumar

Credits Equivalent:

(One credit is equivalent to 10 hours of lectures / organized classroom activity / contact hours; 5 hours of laboratory work / practical / field work / Tutorial / teacher-led activity and 15 hours of other workload such as independent individual/ group work; obligatory/ optional work placement; literature survey/ library work; data collection/ field work; writing of papers/ projects/dissertation/thesis; seminars, etc.)

Course Objective: The prime objective of this course is to provide the basic knowledge of partial differential equations and integral equations by focussing at the various physical aspects of the equations through the different solution schemes/ techniques.

Course Outcomes:

After completing the course satisfactorily, a student will be able:

CO1 To explain about the Linear and Non Linear partial differential equations (of particular order and degree) and their formation along with their solution.

CO2 To know about Lagrange's method, Charpit's method along with their distinct approach to solve the Partial differential equations.

CO3 To explain about the basic integral equations, especially some special kind of integral equations and their solutions.

CO4 To convert the ordinary differential equations (of specific order and degree) into their respective integral equations.

Attendance Requirements:

Students are expected to attend all lectures in order to be able to fully benefit from the course. A minimum of 75% attendance is a must failing which a student may not be permitted to appear in examination.

Evaluation Criteria:

1. Mid Term Examination:20
2. End Term Examination:60

3. Continuous Internal Assessment: 20**.**

Course Contents:

Unit I: Origin of partial differential equations, Linear partial differential equations of order one: Lagrange's method, Non linear partial differential equations of order one: Charpit's method, Homogeneous linear partial differential equations with constant coefficients.
(10 Hrs)

Practicum

·Solving the Exercises of the selected Chapters.

·Implementation on the selected real world problems.

UNIT-II: Integral Equations: Preliminary concepts, Conversion of ordinary differential equations into integral equations, Homogeneous Fredholm Integral equations of the second kind with separable (degenerate) kernels, Fredholm Integral equations of the second kind with separable (degenerate) kernels.
(10 Hrs)

Practicum

·Solving the Exercises of the selected Chapters.

·Implementation on the selected real world problems.

General Practicum:

i. Classroom Presentation

ii. Model/Chart/PowerPoint based presentations

iii. Assignment/ Write Up/Creative work

iv. Books/Journals Readings

v. Tutorials/PBL

Essential Readings:

1. M.D. Raisinghania (2013). Ordinary and Partial Differential Equations, Eighteenth Edition, S. Chand.

2. M.D. Raisinghania (2013). Integral equations and Boundary value problems, Sixth Edition, S. Chand.

Suggested Additional Readings:

1. A.D. Polyanin, A.V. Manzhirov. Handbook of Integral equations, Second Edition, Chapman & Hall/ CRC.