Topics by the Week

Week	Topics
1	Review to ODE
2	Two-point Boundary Value Problems.
3	Fourier Series.
4	The Fourier Convergence Theorem.
5	Even and Odd Functions.
6	Separation of Variables; Heat conduction in a rod.
7	Separation of Variables; Heat conduction in a rod.
8	Other Heat Conduction Problems.
9	The Wave Equation; Vibrations of Elastic String.
10	Laplace's Equation.
11	Boundary Value Problems; the occurrence of two-point BVP.
12	Strum-Liouville Boundary Value Problems.
13	Nonhomogeneous Boundary Value Problems.
14	Singular Strum-Liouville Problems. Further Remarks on the method of Separation of Variables.
15	A Bessel Series Expansion; Mean Convergence.
16	Final Exams.

Course Objectives

This module aims to provide students with an introduction to partial differential equations, that contains the structure and the properties of solutions of PDE's and Fourier Series. It also covers the Sturm-Liouville theory and the eigenfunction expansions, as well as the Dirichlet problem for Laplace's operator and potential theory .

Learning Outcomes

- Determine The Fourier series for any given function .
- Solve the PDE's using the method of separation of variables.
- Solve the Dirichlet and Neumann Problems.
- Discuss the major properties of Boundary Value problems and Sturm-Liouville problems and their solutions.

Assessment Distribution

Students will be assessed based on a 100 total marks distributed as follows.

Exam Type	Expected Time	Points Allocated
First	19/11/2014 - 27/11/2014	20%
Second	28/12/2014 - 06/01/2015	20%
Quizzes	3 quizzes (at least)	20%
Final	01/02/2015 - 09/02/2015	40%

Textbook and References

− William E. Boyce and Richard C. Diprima, **Elementary Differential Equations and Boundary Value Problems , 10th Edition**, John Wiley.

− Stanley J. Farlow, **Partial Differential Equations for Scientists and Engineers**, John Wiley & Sons, Inc.

− Yehuda Pinchover and Jacob Rubinstein, **Introduction to Partial Differential Equations**, Cambridge University Press.

Class Attendance

Attendance is expected of every student. Being absent is not an excuse for not knowing about any important information that may have been given in class. Under the University's regulations, a student whose absence record exceeds 15% of total class hours will automatically fail the course. Students who in any way disrupt the class will be expelled from the classroom and will not be allowed to return until the problem has been resolved.

Late Exams

Late (make-up) exams will be given only to students who have a valid excuse and are able to provide a written document for its verification. The level of difficulty of a late exam is about 50% higher than that of the corresponding regular exam. All late exams will be conducted during the last week of the semester. Each student is allowed only one make-up in a semester, either for the first exam or the second, but not both. There is no make-up for a late exam.

Dishonesty

Any form of dishonest conduct will be strictly punished. A student who is caught cheating, or attempting to do so in an exam will be given a zero for the exam and a report will be written to the Dean for further action. A student who helps another student or is seen communicating with another student in an exam will be given the same penalty stated in the previous point. Students with different exam forms are not exempt from the above rules. Repeat offenders will be expelled permanently and banned from future courses.