Course Specifications

General Information

Course name	Partial Diff. Equations
Course number	MATH4328
Faculty	
Department	
Course type	College Needs
Course level	4
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - Encourages a view of mathematics as a way of thinking and as a language for communicating ideas, and to develop effective ways of visualizing and thinking more generally

2 - Apply the methods of solution of the first and second order linear partial differential equations

3 - Learn the tools and ethics related to the boundary value problems

Intended Learning Outcomes

Knowledge and Understanding	* Describe the importance of partial differential equations and the relation between partial differential equations and other sciences in solving Society problems * Mention different terminology in pure and applied mathematics * Illustrate discussion and thought, leading to solution of the initial boundary value problems
Intellectual Skills	* - Conclude the essential facts, concepts, principles and theories relating to the linear first and second order partial differential equations * Analyze the theories of the linear first and second order partial differential equations. * Apply the separation of variables and D'Lambert methods for solving second order partial differential equations
Professional Skills	* Apply the methods of solution of the linear second order partial differential equations related to physical problems. * Construct physical problems and find suitable solutions for their problems.
General Skill	* Apply the learned concepts in other areas such as physical, sciences and engineering.

Course Contents

1 - 1- Partial differential equations of first order: Characteristic Equation for linear equations, solutions that satisfy certain conditions.
2 - 2- Second order linear partial differential equations: equations with constant coefficients, classification of second order equation, canonical forms, separation of variables method.
3 - 3-Fourier transform methods for solving BVPs
4 - 4- Laplace Transforms for solving BVPs

Teaching and Learning Methods

1 - Lectures using whiteboard.
2 - Problem discussions with students
3 - Independent search of students about certain results or applications.

Students Assessment

Assessment Method	TIME	MARKS
Midterm examination 1	first week 7	25%
Midterm examination 2	first week 12	25%
Final Examination	week 15	50%

Books and References

Essential books	Elementary Boundary Value Problems, T. A. Bick, Pure and Applied mathematics, New York, 1993-.
Recommended books	Partial Differential Equations for Scientists and Engineers, G. Stephenson, Longman, London, 1986.
	Partial Differential Equations an Introduction, Walter A. Strauss, John Wiley and Sons, Ltd, 2008..