

Semester	Code	Module Title	Credits	C/E/O	GPA/NGPA
7,8	MA4110	Finite Element Analysis	3	E	GPA
Hours/Week		Pre-requisites/Co-requisites	Evaluation (%)		
Lecture	Tute/Lab		CA	WE	
3	0	MA2014	30	70	

Learning Outcomes

After the successful completion of this course students should be able to

- Understand the weak forms of PDEs
- Solve them numerically by Finite Element Methods.

Syllabus Outline

The Basic Framework for Stationary Problems

- Some Model PDEs
- The weak form of a BVP
- The Galerkin method
- Piecewise polynomials and the finite element method
- Convergence of the finite element method

Data Structures and Implementation

- The mesh data structure
- Programming the finite element method: Linear Lagrange triangles
- Lagrange triangles of arbitrary degree
- The finite element method for general BVPs

Adaptive Methods

- Adaptive mesh generation
- Error estimators and indicators