E4221 August 2:1

DSP and AI Techniques in Power System Protection

Instructor

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Teaching Assistant

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Department: Electrical Engineering Department

Course Time: Mon., Wed., 11am-12pm

Lecture venue: B218

Detailed Course Page: http://www.ee.iisc.ac.in/academics-courseprograms-details.php#E4221

Announcements

Brief description of the course

The course is offered for MTech, MTech (Research) and Ph D students to learn and to update their knowledge

in the area of Advanced Power System Protection

Prerequisites

The students should have done the course on switch gear and protection in their undergraduate (BE/BTech)

programme. Also students should have done the course on Digital Signal Processor based hardware.

Syllabus

Development of Digital protection schemes based on state of the art hardware using Digital Signal processors

and digital signal processing (DSP) programming techniques. Application of Artificial Intelligence (AI)

techniques to improve the performance of digital protection schemes.

Course outcomes

Recent trends in the area of power system protection and to learn through lab exercises to implement high

speed and and accurate power protection algorithms on DSP hardware. Understanding the use of Artificial

Intelligence techniques such as Neural Networks and Fuzzy logic techniques in digital power system

protection schemes.

Grading policy

Test I: 20%

Test II: 20%

Assignments: 10%

Lab Exercises (Demo of results/Report submission): 15%

Final Exam: 35%

Assignments

Assignment I: Writing the software and verification of the results on Digital Protection Algorithms

Assignment II: Simulation of Transients using Basics of Electro Magnetic Transient Techniques

Resources

.Text books on Protective Relaying and Computer Application on Relaying

.Technical papers published in IEEE, CIGRE and IEE journals and conferences.

.MATLAB Tool boxes /User Guides on Power Systems Block set, Neural Networks, Fuzzy logic and Signal Processing Techniques such as Digital filter designs.