UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR
Course Description

Title of Course: Teaching and Research Methodology
Course Code: MVLSI301
L-T-P Scheme: 4-0-0   **Course Credits: 4**

Introduction:

The study of conducting research is Research Methodology. Research: The word research is composed of two syllables "Re" and "Search"."Re" is the prefix meaning 'Again or over again or a new' and "Search" is the latter meaning 'to examine closely and carefully' or 'to test and try'.Together they form, a careful, systematic, patient study and investigation in some field of knowledge undertaken to establish principles / policies.

Objective: Data mining is a class of analytical techniques that examine a large amount of data to discover new and valuable information. This course is designed to introduce the core concepts of data mining, its techniques, implementation, benefits, and outcome expectations from this new technology. It will also identify industry branches which most benefit from DM (such as retail, target marketing, fraud protection, health care and science, web and ecommerce). The course will focus on business solutions and results by presenting detailed case studies from the real world and finish with implementing leading mining tools on real (public domain) data.

Learning Outcomes:

1. Understand data mining principles and techniques: Introduce DM as a cutting edge business intelligence method and acquaint the students with the DM techniques for building competitive advantage through proactive analysis, predictive modeling, and identifying new trends and behaviors. Learning objectives include:

a. Building basic terminology.

b. Learning how to gather and analyze large sets of data to gain useful business understanding.

c. Learning how to produce a quantitative analysis report/memo with the necessary information to make decisions.

d. Describing and demonstrating basic data mining algorithms, methods, and tools

e. Identifying business applications of data mining

f. Overview of the developing areas - web mining, text mining, and ethical aspects of data mining.

2. Develop and apply critical thinking, problem-solving, and decision-making skills.

3. Develop and apply enthusiasm for learning. Class participation is encouraged in this course. Enriching classroom discussions and learning by communicating interest, suggestions for improvements, additional readings and Internet resources, is a major goal. Express

diligence, enthusiasm, patience, and thoroughness in dealing with complicated analysis and procedures and less-than-perfect-constantly-evolving technology.

Course Contents:

Unit –I: Instruction

Introduction to content, Elements of instruction, Learning objectives, Roles of the teacher and the learner in instruction

Unit –II: Teaching and Learning

Application of theories of learning to teaching and learning, Sequence of learning and Strategies of learning, Teaching methods, their merits and demerits, Use of ICT in teaching & learning, Classroom management, Individual differences.

Unit –III: Planning for teaching and learning

Understanding the syllabus, Preparation of a scheme of work, Lesson plan preparation, Micro teaching.

Unit –IV: Assessment and Evaluation

Define measurement, assessment, test, evaluation, Purpose of assessment and evaluation, Types of tests, Grading and reporting the results assessment. Evaluating teaching and learning

Unit –V: Definition and explanation of research

Types and Paradigms of Research, History and Philosophy of Research (esp. Philosophical evolution, pathways to major discoveries & inventions), Research Process decision, planning, conducting, Classification of Research Methods; Reflective Thinking, Scientific Thinking.

Unit –VI: Research problem formulation:

Literature review- need, objective, principles, sources, functions & its documentation, Problem formulation esp. sources, considerations & steps, Criteria of a good research problem, Defining and evaluating the research problem, Variables esp. types & conversion of concepts to variables. Research design esp. Causality, algorithmic, quantitative and qualitative designs, and various types of designs. Characteristics of a good research design, problems and issues in research design; Hypotheses: Construction, testing, types, errors; Design of experiments especially classification of designs and types of errors.

Unit –VII: Problem solving:

Understanding the problem- unknowns, data & conditions, conditions - satisfiability, sufficiency, redundancy & contradiction, Separation of parts of the problem and conditions, notations; devising a plan- connection between data and unknown, similar/related problems, reuse of previous solutions, rephrasing/transforming the problem, solving partial or related problem, Transforming data and unknowns; carrying out the plan- esp. correctness of each step in multiple ways; Evaluation of solution and method- checking correctness of solution, different derivations, utility of the solution

Unit –VIII: Data & Reports:

Infrastructural setups for research; Methods of data collection esp. validity and reliability, Sampling; Data processing and Visualization especially Classification; Ethical issues especially. bias, Misuse of statistical methods, Common fallacies in reasoning. Research Funding & Intellectual Property; Research reports: Research Proposal & Report writing esp. Study objectives, study design, problems and limitations; Prototype micro- project report implementing a major part of all the above (compulsory assignment

Text Book:

1. Kotahri C.R., Research Methodology: Methods and Trends.
2. Stuart Melville and Wayne Goddard - Research Methodology: An Introduction for Science & Engineering Students.

Reference Books:

1. Brian W. Kernighan and Rob Pike, The Practice of Programming, Addison-Wesley, 1999.

Faculty In-Charge   HOD, CSE Dept.

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR
Course Description

Title of Course: AdvancedDigital Signal Processing lab
Course Code: MVLSI381
L-T-P scheme: 0-0-3   **Course Credit: 2**

Objectives:
The main objective of this course is to introduce the architecture ofDSP processor for developing real-time applications. In this coursestudents will learn about the computational building blocks and thebasic architectural features of DSP.They will learn about programmabledigital signal processors and implementation details of DSP algorithmslike digital filters, including basic adaptive filters and FfTs. They will alsobe introduced to CODEC programming and interfacing codec and DSP as well as several real-world applications of DSP processors.

Learning Outcomes:
1. Understand the architecture and building blocks of digital signalprocessor.
2. Analyze and process signals using DSP Processor.
3. Implementing FIR, IIR and basic adaptive filters to suit specificrequirements for specific applications.
4. Learn codec programming and interfacing it with DSP.
5. Understand the applications of DSP processors
6. Designing and implementing a small application using DSPprocessor

Course Contents:
Exercises that must be done in this course are listed below:
Experiment 1: - Generate continuous and Discrete signal
Experiment 2: - Graphical representation of unit step signal
Experiment 3: - Graphical representation of unit sample signal
Experiment 4: - Graphical representation of unit ramp signal
Experiment 5: - Graphical representation of exponential signal
Experiment 6: - Graphical representation of exponential increasing- decreasing signal
Experiment 7: - Graphical representation of even signal
Experiment 8: - Graphical representation of odd signal
Experiment 9:-   Determine whether given signal is periodic or not
Experiment 10: - Convolution of given sequences
Experiment 11: - Cross correlation of given sequences
Experiment 12: - Plot Magnitude and Phase Response
Experiment 13: - Impulse Response of a given System
Experiment 14: -Z Transform of the Sequence a given sequence
Experiment 15: - Inverse Z Transform of the Sequence a given sequence
Experiment 16: - DFT and IDFT of a Sequence
Experiment 17: - 8- point DFT of the Sequence
Experiment 18: - Circular convolution of following sequences

Text Book:
1. J. G. Proakis and D. G. Manolakis, "Digital Signal Processing", Prentice Hall India, 3rd edition, 1997, ISBN: 81-203-1129-9

Recommended Systems/Software Requirements:
1. SCILAB