KJ's Educational Institute
K.J.College of Engineering & Management Research, Pune
Computer Department

Fourth Year of Computer Engineering(Course 2015)

(with effect from 2018-19)

Program Educational Objectives

1. To prepare globally competent graduates having strong fundamentals, domain knowledge, updated with modern technology to provide the effective solutions for engineering problems.
2. To prepare the graduates to work as a committed professional with strong professional ethics and values, sense of responsibilities, understanding of legal, safety, health, societal, cultural and environmental issues.
3. To prepare committed and motivated graduates with research attitude, lifelong learning, investigative approach, and multidisciplinary thinking.
4. To prepare the graduates with strong managerial and communication skills to work effectively as individual as well as in teams.

Program Outcomes

Students are expected to know and be able –

- To apply knowledge of mathematics, science, engineering fundamentals, problem solving skills, algorithmic analysis and mathematical modeling to the solution of complex engineering problems.
- To analyze the problem by finding its domain and applying domain specific skills
- To understand the design issues of the product/software and develop effective solutions with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- To find solutions of complex problems by conducting investigations applying suitable techniques.
- To adapt the usage of modern tools and recent software.
- To contribute towards the society by understanding the impact of Engineering on global aspect.
- To understand environment issues and design a sustainable system.

- To understand and follow professional ethics.
- To function effectively as an individual and as member or leader in diverse teams andinterdisciplinary settings.
- To demonstrate effective communication at various levels.
- To apply the knowledge of Computer Engineering for development of projects, and its finance andmanagement.
- To keep in touch with current technologies and inculcate the practice of lifelong learning.

Program Specific Outcomes (PSO)

A graduate of the Computer Engineering Program will demonstrate-

PSO1: Professional Skills-The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networkingfor efficient design of computer-based systems of varying.

PSO2: Problem-Solving Skills- The ability to apply standard practices and strategies in software projectdevelopment using open-ended programming environments to deliver a quality product for business success.

PSO3: Successful Career and Entrepreneurship- The ability to employ modern computer languages,environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies.

High Performance Computing

Course Objectives:

- To study parallel computing hardware and programming models
- To be conversant with performance analysis and modeling of parallel programs
- To understand the options available to parallelize the programs
- To know the operating system requirements to qualify in handling the parallelization

Course Outcomes:

On completion of the course, student will be able to–

- Describe different parallel architectures, inter-connect networks, programming models
- Develop an efficient parallel algorithm to solve given problem
- Analyze and measure performance of modern parallel computing systems
- Build the logic to parallelize the programming task

Artificial Intelligence and Robotics

Course Objectives :

- To understand the concept of Artificial Intelligence (AI)
- To learn various peculiar search strategies for AI
- To acquaint with the fundamentals of mobile robotics
- To develop a mind to solve real world problems unconventionally with optimality

Course Outcomes:

On completion of the course, student will be able to–

- Identify and apply suitable Intelligent agents for various AI applications
- Design smart system using different informed search / uninformed search or heuristicapproaches.
- Identify knowledge associated and represent it by ontological engineering to plan a strategyto solve given problem.
- Apply the suitable algorithms to solve AI problems

Data Analytics

Course Objectives:

- To develop problem solving abilities using Mathematics
- To apply algorithmic strategies while solving problems
- To develop time and space efficient algorithms
- To study algorithmic examples in distributed, concurrent and parallel environments

Course Outcomes:

On completion of the course, student will be able to–

- Write case studies in Business Analytic and Intelligence using mathematical models
- Present a survey on applications for Business Analytic and Intelligence
- Provide problem solutions for multi-core or distributed, concurrent/Parallel environments

Digital Signal Processing

Course Objectives:

- To Study and understand representation and properties of signals and systems.
- To learn methodology to analyze signals and systems
- To study transformed domain representation of signals and systems
- To explore Design and analysis of Discrete Time (DT) signals and systems
- To Understand Design of filters as DT systems
- To get acquainted with the DSP Processors and DSP applications

Course Outcomes:

On completion of the course, student will be able to–

- Understand the mathematical models and representations of DT Signals and Systems
- Apply different transforms like Fourier and Z-Transform from applications point of view.
- Understand the design and implementation of DT systems as DT filters with filter structuresand different transforms.
- Demonstrate the knowledge of signals and systems for design and analysis of systems
- Apply knowledge and use the signal transforms for digital processing applications Perform and evaluate present worth, future worth and annual worth analyses on one of more economic alternatives.
- Be able to carry out and evaluate benefit/cost, life cycle and breakeven analyses on one or more economic alternatives.

Software Architecture and Design

Course Objectives:

- To introduce basic concepts and principles about software design and software architecture

- To learn practical approaches and methods for creating and analyzing software architecture

- To acquaint with the interaction between quality attributes and software architecture
- To experience with examples in design pattern application and case studies in softwarearchitecture

Course Outcomes:

On completion of the course, student will be able to–

- Express the analysis and design of an application

- Specify functional semantics of an application

- Evaluate software architectures
- Select and use appropriate architectural styles and software design patterns

Pervasive and Ubiquitous Computing

Course Objectives:
- To understand the characteristics and principles of Pervasive computing
- To introduce to the enabling technologies of pervasive computing
- To understand the basic issues and performance requirements of pervasive computingapplications
- To learn the trends of pervasive computing

Course Outcomes:
- On completion of the course, student will be able to–
- Design and implement primitive pervasive applications
- Analyze and estimate the impact of pervasive computing on future computing applicationsand society
- Develop skill sets to propose solutions for problems related to pervasive computing system
- Design a preliminary system to meet desired needs within the constraints of a particularproblem space

Software Testing and Quality Assurance

Course Objectives:

- Introduce basic concepts of software testing
- Understand white box, block box, object oriented, web based and cloud testing
- Know in details automation testing and tools used for automation testing
- Understand the importance of software quality and assurance software systems development.

Course Outcomes:

On completion of the course, student will be able to–

- Describe fundamental concepts in software testing such as manual testing, automation testing and software quality assurance.
- Design and develop project test plan, design test cases, test data, and conduct test operations
- Apply recent automation tool for various software testing for testing software
- Apply different approaches of quality management, assurance, and quality standard tosoftware system
- Apply and analyze effectiveness Software Quality Tools

Laboratory Practice I

Course Objectives and Outcomes: Practical hands on is the absolute necessity as far as employability of the learner is concerned. The presented course is solely intended to enhance the competency by undertaking the laboratory assignments of the core courses.

Laboratory Practice II

Course Objectives and Outcomes: Practical hands on is the absolute necessity as far as employability of the learner is concerned. The presented course is solely intended to enhance the competency by undertaking the laboratory assignments of the core courses. Enough choice isprovided to the learner to choose an elective of one‟s interest.

Project Work Stage I

Course Objectives:
- To Apply the knowledge for solving realistic problem
- To develop problem solving ability
- To Organize, sustain and report on a substantial piece of team work over a period of severalmonths
- To Evaluate alternative approaches, and justify the use of selected tools and methods,
- To Reflect upon the experience gained and lessons learned,
- To Consider relevant social, ethical and legal issues,
- To find information for yourself from appropriate sources such as manuals, books, researchjournals and from other sources, and in turn increase analytical skills.
- To Work in TEAM and learn professionalism.

Course Outcomes:

On completion of the course, student will be able to–
- Solve real life problems by applying knowledge.
- Analyze alternative approaches, apply and use most appropriate one for feasible solution.
- Write precise reports and technical documents in a nutshell.
- Participate effectively in multi-disciplinary and heterogeneous teams exhibiting team work,Inter-personal relationships, conflict management and leadership quality.

Machine Learning

Course Objectives:
- To understand human learning aspects and relate it with machine learning concepts.
- To understand nature of the problem and apply machine learning algorithm.
- To find optimized solution for given problem.

Course Outcomes:

On completion of the course, student will be able to–
- Distinguish different learning based applications
- Apply different preprocessing methods to prepare training data set for machine learning.
- Design and implement supervised and unsupervised machine learning algorithm.
- Implement different learning models
- Learn Meta classifiers and deep learning concepts

Information and Cyber Security

Course Objectives:
- To offer an understanding of principle concepts, central topics and basic approaches ininformation and cyber security.
- To know the basics of cryptography.
- To acquire knowledge of standard algorithms and protocols employed to provideconfidentiality, integrity and authenticity.
- To enhance awareness about Personally Identifiable Information (PII), Information
- Management, cyber forensics.

Course Outcomes:

On completion of the course, student will be able to–
- Gauge the security protections and limitations provided by today's technology.
- Identify information security and cyber security threats.
- Analyze threats in order to protect or defend it in cyberspace from cyber-attacks.
- Build appropriate security solutions against cyber-attacks.

Embedded and Real Time Operating System

Course Objectives:
- To understand a typical embedded system and its constituents
- To learn the selection process of processor and memory for the embedded systems
- To learn communication buses and protocols used in the embedded and real-time systems
- To understand real-time operating system (RTOS) and the types of RTOS
- To learn various approaches to real-time scheduling
- To learn software development process and tools for RTOS applications

Course Outcomes:

On completion of the course, student will be able to–
- Recognize and classify embedded and real-time systems
- Explain communication bus protocols used for embedded and real-time systems
- Classify and exemplify scheduling algorithms
- Apply software development process to a given RTOS application
- Design a given RTOS based application

Cloud Computing

Course Objectives:

- To understand cloud computing concepts;
- To study various platforms for cloud computing
- To explore the applications based on cloud computing

Course Outcomes:

On completion of the course, student will be able to–

- To install cloud computing environments.
- To develop any one type of cloud
- To explore future trends of cloud computing

Laboratory Practice III

Course Objectives and Outcomes:

Practical hands on is the absolute necessity as far as employability of the learner is concerned. The presented course is solely intended to enhance the competency by undertaking the laboratory assignments of the core courses.

Laboratory Practice IV

Course Objectives and Outcomes:

Practical hands on is the absolute necessity as far as employability of the learner is concerned. The presented course is solely intended to enhance the competency by undertaking the laboratory assignments of the elective courses. Enough choice is provided to the learner to choose an elective of one¨s interest.

Project Work Stage II

Course Objectives:

- To follow SDLC meticulously and meet the objectives of proposed work

- To test rigorously before deployment of system

- To validate the work undertaken
- To consolidate the work as furnished report.

Course Outcomes:

On completion of the course, student will be able to–

- Show evidence of independent investigation

- Critically analyze the results and their interpretation.

- Report and present the original results in an orderly way and placing the open questions inthe right perspective.

- Link techniques and results from literature as well as actual research and future research lineswith the research.

- Appreciate practical implications and constraints of the specialist subject