

Bachelor of Science (Hons) Software Engineering (KA 10947) **KP/JPS(KA 10947)**

Software engineering is a profession as well as field of study related to all aspects of the software life cycle, covering the design, implementation, modification and maintenance of software in a systematic and quantifiable fashion. The various methodologies in this rapidly expanding field of endeavour are derived from the framework and principles associated with traditional engineering disciplines, and have as their end goal the creation of higher quality, cheaper, efficient and easily maintainable software. Its relevance and application is increasing rapidly in a large variety of domains in business, science, entertainment and education today; where software applications that are deployed continue to evolve in complexity and functionality.

This programme provides extensive coverage of the various techniques, principles, and tools for the major areas of software design, software testing, software processes and requirements engineering. Instruction on advanced programming techniques in a variety of software development languages is provided to impart a strong practical flavour to the course, in which students are able to relate theoretical constructs to actual hands-on experience in software development. This is also supplemented with exposure to related communication and network technologies such as the Internet and mobile cellular networks. The programme aims to produce graduates who are capable and confident of utilizing state-of-the-art techniques and methodologies in all phases of the software life cycle, and to relate this process effectively to the variety of application domains in the current global environment where large, complex software systems will be deployed in.

Programme Objectives

The Programme Objectives describe the career and professional accomplishments that graduates of the Software Engineering programme would be expected to be capable of achieving in a few years after graduation. These objectives are:

1. To produce graduates who will utilize state-of-the-art knowledge, techniques, and technologies in requirements analysis, design, construction, testing, implementation, and evolution of software systems.
2. To produce graduates who are capable of undertaking research and development in the field of software engineering and software-related technology.
3. To produce graduates who will assume professional and managerial roles guided by knowledge of technopreneurship and ethical, legal, and social issues.

Programme Learning Outcomes:

After completing this programme, students will be able to:

- A. Understand a problem domain and to elicit, analyse, and specify the requirements of a software system solution
- B. Design, model, construct, test, and evolve software systems
- C. Demonstrate knowledge of technologies, systems, processes, techniques, tools, and management of the development and evolution of software solutions
- D. Recognize ethical, legal, and social factors that impact software projects and the responsibilities of a software professional
- E. Demonstrate skills in written and oral communication and to relate to people in various situations
- F. Identify opportunities and challenges for innovation and improvement in various application domains
- G. Work independently and to cooperate and contribute as a team, and to serve the community and nation
- H. Demonstrate the ability of self-development and self-learning toward life-long improvement

Careers

Graduates can expect to find employment in a variety of careers related to software development in various areas in business and financial institutions, manufacturing and engineering, scientific organizations and government agencies. Other career avenues include, but are not limited to, information technology (IT) consultancy, system support and maintenance, chief technology officers, project management, sales, web and mobile application developers, R&D engineers, technical trainers, freelance programmers and entrepreneurs of software startups.

Subjects

Year 1

Introduction to Computer Organisation and Architecture
Programming Concepts and Design
Database System Fundamentals
Object-Oriented Modelling
Data Structures and Algorithms
Website Development
Data Communications and Networks

Year 2

Software Design and Testing
Web Programming
User Interface Design
Software Project Management
Software Process and Requirements Engineering
Operating Systems
Industrial Training

Year 3

Advanced Programming Techniques

Web Engineering
Programming Language Concepts
Technopreneurship
Computer Ethics and Professional Responsibility

Electives *

TCP/IP Internetworking
Multimedia Technology
Artificial Intelligence
Electronic Commerce
Parallel Processing
Distributed Computer Systems
Advanced Database Systems
Data Mining
Multimedia Design and Application Development
Web Services Development
Wireless Application Development
Cyber Law
Formal Methods
Software Validation and Verification
Computer Graphics using OpenGL

*Subject to availability

MQA Subjects

Bahasa Kebangsaan/Foreign Language
Pengajian Malaysia
Pendidikan Moral/Pengajian Islam

University Subjects

Co-Curriculum
Sun Zi's Art of War and Business Strategies