(4) Software Engineering

Course description of Major Elective Courses

Number of credits (Lecture – Laboratory – Self-study)

ITDS 361   Software Design and Development   3 (2 – 2 – 5)

Prerequisite: ITDS 261

Co-requisite: None

Principles of the software design and software architecture; methodologies and techniques of designing the software system architecture; the requirement analysis of the software design; design patterns; the efficiency factor analysis of the software design; the software evolution

ITDS 362   Software Quality Assurance and Testing   3 (2 – 2 – 5)

Prerequisite: ITDS 261

Co-requisite: None

The software quality assurance process; avoiding errors and other quality problems; inspections and reviews; testing, verification and validation techniques; the process assurance versus the product assurance; quality process standards; the product and process assurance; the problem analysis and reporting; statistical approaches to the quality control

ITDS 363   Software Requirement Analysis and Specification   3 (2 – 2 – 5)

Prerequisite: ITDS 261

Co-requisite: None

Domain engineering; techniques for discovering and eliciting requirements; languages and models for representing requirements; analysis and validation techniques including needs, goals, and the use case analysis; requirements in the context of system engineering; specifying and measuring external qualities: performance, reliability, availability, safety and security; specifying and analyzing requirements for various types of systems: embedded systems, consumer systems, web-based systems, business systems, systems for science and engineering; resolving feature interactions; requirements documentation standards; traceability; human factors; requirements in the context of agile processes; requirements management

ITDS   364   Software Project Management   **3 (3 – 0 – 6)**

Prerequisite: ITDS 261

Co-requisite: None

   Project planning; project management tools; managing the system life cycle; the cost estimation and project scheduling; the human resource management; factors influencing productivity and success; productivity metrics; the key performance index for the project efficiency and effectiveness; project evaluations determining skill requirements and staffing of the projects; cost-effectiveness analysis; reporting and presentation techniques; the effective management in both behavioral and technical aspects; change management and planning; the option analysis and risks; the release and configuration management; the development of software projects; software contracts and the intellectual property; case studies of real industrial projects

ITDS   365   Agile Software Development   **3 (2 – 2 – 5)**

Prerequisite: ITDS 261

Co-requisite: None

   Agile values, principles and practices; managing an agile team: roles and responsibilities; the product discovery; the agile planning for software products; the agile development process; testing with agile; agile metrics; practice of the agile development to a real-world software development project

ITDS   366   Practical Software Engineering   **3 (0 – 6 – 3)**

Prerequisite: ITDS 261

Co-requisite: None

   Practicing the software development using a standard process of software engineering: requirement analysis, software design, software construction, software testing, software quality assurance, software project planning and management