



جَامِعَةُ التَّقْنِيَةِ وَالْعُلُومِ التَّطْبِيقِيَّةِ  
 University of Technology and Applied Sciences  
 Higher College of Technology الكليَّةُ التَّقْنِيَّةُ العُلْيَا

Specialization	Software Engineering				
Brief description of the Specialization	This specialization aims to produce Software Engineering Graduates to meet the industry needs, with excellence in technical skills, team spirit, communication skills, social awareness and ethical responsibilities				
Sl.No.	Course Code	Course Name	Prerequisite		Brief description of the Course
			Course Code	Course Name	
1	ITIS101	Fundamentals of Information Technology	FPIT0001	IT For Foundation	This is an introductory course that provides fundamental concepts about the various specializations of the IT field. It emphasizes Internet technology, logic formulation, computer number systems, principles of logical thinking and problem-solving, academic integrity using anti-plagiarism software, security management and other computer ethical issues.
2	ITSE101	Programming I	ITIS101	Fundamentals of Information Technology	This course introduces the basics of programming language using Python. It enables the students to write programs using different programming paradigms including functions.
3	ITSE102	Introduction to Operating Systems	ITSE101	Programming I	This course will cover fundamentals of operating system concepts such as processes, inter-process communication, input-output, memory management, file systems, and security. It enables the students to work with Unix operating system by writing simple shell scripts.

4	ITSE204	Course Project	ITSE202 AND ITDB201	Introduction to Software Engineering AND Web Application Development I	This course enable students to develop a software system using the knowledge and skills acquired in Diploma level.
5	ITSE205	Data Structures and Algorithms	ITSE201	Programming II	This course will cover analysis of algorithms, sorting, searching, hashing and various data structures like lists, stacks, queues, Trees and Graphs with the implementation
6	ITSE202	Introduction to Software Engineering	None	None	This course will cover software engineering principles, software process models, Requirements Engineering, Software Requirements Specifications, Project management fundamentals, introduction to software design and testing.
7	ITSE203	Object Oriented Programming	ITSE101	Programming I	This course will cover the OOPS concepts using Java programming including packages and exceptions handling in detail.
8	ITSE201	Programming II	ITSE101	Programming I	This course will cover advanced programming concepts in Python like functions, file handling, exception handling, data collections and advanced packages.
9	ITSE307	Advanced Operating Systems	ITSE102	Introduction to Operating Systems	Provides the knowledge of design and implementation of Advanced operating systems
10	ITSE302	Advanced Web Technologies	ITDB201	Web Application Development I	This course will cover introduction to XML and it provides a hands on experience of creating XML Documents using XML Schema, Namespaces, XSLT and XPATH. It covers the basics of JQuery and Web Services and AJAX.

11	ITSE304	Computer Graphics	ITSE201	Programming II	This course covers the concepts of computer graphics, algorithms ,2D and 3D Modeling and Animation. The course uses VC++, Open GL and 3DMAX.
12	ITSE305	Computer Organization	ITSE101 AND MATH2200	Programming I AND Discrete Structure	This course will cover Basic Computer Organization and Design. It also includes Data Representation, Pipeline and Vector Processing, Computer Arithmetic, Input-Output Organization, Memory Organization and Assembly Language Programming
13	ITSE303	Digital Image Processing	ITSE201 AND MATH2200	Programming II AND Discrete Structure	This course introduce various image processing techniques like mathematical transformations, Image enhancement, Image restoration, Image compression, Image segmentation and representation.
14	ITSE301	Mobile Application Development	ITSE203 AND ITIS103	Object Oriented Programming AND Web Technologies	This course will cover the mobile application development using Android.
15	ITSE306	Object Oriented Analysis and Design	ITSE202 AND ITSE203	Introduction to Software Engineering AND Object Oriented Programming	This course will cover various software analysis and design issues, UML diagrams with the implementation using case tools like Rational Rose OR Visio.
16	ITSE308	Software Project Management	ITSE202	Introduction to Software Engineering	This course covers all the phases of software project management including the implementation using tools like Primavera project planner, Project Libre
17	ITSE402	Software Design, Integration and Testing	ITSE306	Object Oriented Analysis and Design	This course cover various aspects of software design, integration and testing strategies, software testing techniques, test standards, software quality and software reliability.

18	ITSE408	Advanced Object Oriented Programming	ITSE203	Object Oriented Programming	This course will cover advanced concepts in java including JSF, Java Beans and Hybernate.
19	ITSE414	Course Project 1	ITSE306	Object Oriented Analysis and Design	This course covers the analysis, design and partial implementation of application/research work with novel ideas using the knowledge and skills acquired.
20	ITSE407	Introduction to Artificial Intelligence	ITSE205	Data Structures and Algorithms	This course will introduce the fundamentals of Artificial Intelligence and covers the concepts of Searching, CSP, Knowledge Representation, Bayesian Networks, Markov Models and Logic Programming to solve AI related problems using Python.
21	ITSE404	Course Project 2	ITSE414	Course Project 1	This course completes the implementation and deployment of application/research work done in Course Project 1
22	ITSE415	Applied Data Science	MATH311 AND ITSE101	Probability and Statistics for IT AND Programing I	This course introduces the fundamentals of Data Science methods and Machine Learning including the techniques to perform data analysis, data visualization, Exploratory Data analysis and natural language processing.
23	ITSE405	Theory of Computation	MATH2200 AND ITSE205	Discrete Structures AND Data Structures and Algorithms	This course will cover introduction to automata, formal language theory and computability, finite state and pushdown automata, introduction to regular languages, context free languages, Turing machines and basic of compilers including Lexical Analysis to Code Generation
24	ITSE411	Advanced Computer Graphics and Game Design	ITSE304	Computer Graphics	This course covers the advanced Computer Graphic and Gaming concepts like Game Objects, User Interfaces, Game Assets, multimedia production, pipeline and implementation using Game Development Tools.

25	ITSE403	Advanced Mobile Application Development	ITSE301	Mobile Application Development	This course covers the cross platform Mobile Application Development including accessing Web Services and content providers.
26	ITSE309	Fundamentals of Robotics	ITSE203 OR ITDB302 OR ITSE302	Object Oriented Programming OR Web Application Development II OR Advanced Web Technologies	This course introduces the basics of Robotics including designing, modeling and implementing a simple Robot