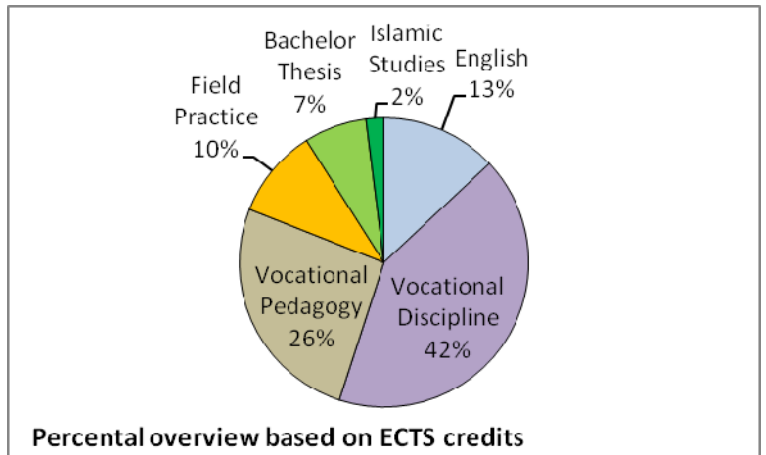


Bachelor of Engineering Technology – Networks

Program Description

Within the specialization of System Administration/Network the student will learn fundamental aspects of Computer Hardware and Architecture, Operating Systems, Architectures of different Networks, Network Configuration, Network Devices, ICT Maintenance (Software Support, Hardware Maintenance, Network Maintenance).



Detailed Program Overview

	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6
English	General, Technical and Pedagogical English 1	General, Technical and Pedagogical English 2	General, Technical and Pedagogical English 3	General, Technical and Pedagogical English 4	General, Technical and Pedagogical English 5	General, Technical and Pedagogical English 6
Vocational Pedagogy	Introduction to Vocational Pedagogy	Basics of Learning and Teaching Organization of TVET	Lesson Planning and Teaching Techniques Didactics Teaching Practice / Micro Teaching	Didactics of the Vocational Discipline Assessment, Self Evaluation and Management of VET Process 5 TRTS Sessions at VTC / CoT, Twin Teaching Peer Counseling	Instructional Technology Developing a Teaching Plan / Curriculum Process 5 TRTS Sessions at VTC / CoT, Twin Teaching Peer Counseling	Differentiation / Individualization / Dealing with Disturbances Managing Complex Learning Arrangements / Preparation Bachelor
Vocational Discipline	Introduction to Information Technology and Programming	Algebra Computer Hardware and Architecture Fundamentals of Telecommunication Programming Languages Logic and Programming	Mathematics Analysis Computer Networks Algorithms and Data Structures	Operating Systems Software Engineering Database Management Systems Network and Systems Administration	Information Technology Management Advanced Switching Advanced Routing Wireless Network	Wide Area Network Trends and Issues in Networks Network Security
Field Practice		Islamic Studies Company Field Practice		Company Field Practice Vocational Field Practice	Vocational Field Practice	
BA Thesis						BA Thesis

Course Descriptions

Semester 1

General, Technical and Pedagogical English 1

The trainees continue to develop their ability to interact and communicate through English, using reading, writing, listening and speaking skills. Instruction will aim to broaden and deepen their knowledge of vocabulary, grammar and structure of English in a communicative context related to their vocational discipline and also to their role as trainers. They should move from a more passive understanding of English to active use in written texts and oral presentations. The goal will be to raise the general level of ability to between B1 and B2 on the Common European Framework scale.

Introduction to Information Technology and Programming

The Trainees are able to explain all relevant fields of Information Technology, their subcategories and intersection(s) with Communications Technology. They demonstrate a firm grasp of key principles of the information sciences such as binary arithmetic, logic and formalizing algorithms. The trainees recall the basics of programming that they have learned in the Diploma and improve their programming competencies significantly. The trainees therefore are capable of using a programming language relevant for the software development and using fundamental ideas of object oriented programming methodology. They understand basic concepts about programming and application languages as well as general and typical characteristics of not imperative languages. Trainees are enabled to learn new programming languages and their applications independently.

Semester 2

General, Technical and Pedagogical English 2

The trainees continue to develop their ability to interact and communicate through English, using reading, writing, listening and speaking skills. Instruction will aim to broaden and deepen their knowledge of vocabulary, grammar and structure of English in a communicative context related to their vocational discipline and also to their role as trainers. They should move from a more passive understanding of English to active use in written texts and oral presentations. The goal will be to raise the general level of ability to between B1 and B2 on the Common European Framework scale.

Algebra

The trainee can use methods of algebra for solving engineering technology and physical problems; is enabled to develop mathematical descriptions for technical processes; and can transform data into diagrams and vice versa.

Computer Hardware and Architecture

This module covers the basic components and hardware of a computer and gives trainees the ability and competencies to explain, install, assemble and upgrade PCs functions and their respective functions of operating systems. Trainees are also enabled to investigate and understand the computer architecture and a microcomputer system and to repair simple and different types of computer faults. They are familiar with the different digital and logic circuits such as register, storages and counter or programmable logic devices. The trainee understands and describes the basic concepts, architecture and internal operations of a computer, microcomputer. They have the ability to investigate, design and implement different digital and logic circuits such as register and counter or programmable logic devices. Trainees demonstrate thorough knowledge of basics and functions of microprocessors, local buses and all relevant computer components, devices and interfaces and they are able to install and use different types and functions of operating systems.

Fundamentals of Telecommunication

Trainees show basic competencies of data communications and networking and about the elements of analogue, digital and optical communications systems; have also knowledge of different modulation techniques and concepts of time division multiplexing; and are able to install a simple communications system and know basics of optical communications systems.

Programming Languages

The trainees are conversant in advanced programming concepts and special procedures for the analysis or synthesis of programs; know programming methods to object oriented, functional or logical paradigms and they are able to use advanced concepts of object oriented programming that include: classes and ADT, recursions, records, inheritance and composition, operator overloading, graphics and applets, and exception handling; and also have competencies to describe and apply main criteria needed to evaluate and compare programming languages and to demonstrate and contrast the different capabilities of programming languages for various programming tasks and problems.

Logic and Logic Programming

The trainees understand the principles of Boolean Logic and are able to explain, formulate and solve logical problems. A base knowledge of classical problems for educational purposes is necessary, and a firm understanding of deductive reasoning and systematic solution by automated systems must be displayed. Trainees are apt at Logic Programming and are aware of other approaches such as Functional Programming. These skills include the ability to explain the differences between Logic, Functional and Declarative Programming.

Semester 3

General, Technical and Pedagogical English 3

The trainees continue to develop their ability to interact and communicate through English, using reading, writing, listening and speaking skills. Instruction will aim to broaden and deepen their knowledge of vocabulary, grammar and structure of English in a communicative context related to their vocational discipline and also to their role as trainers. They should move from a more passive understanding of English to active use in written texts and oral presentations. The goal will be to raise the general level of ability to between B1 and B2 on the Common European Framework scale.

Mathematics Analysis

The trainees can use methods of analysis for solving engineering technology and physical problems; are enabled to develop mathematical descriptions for technical processes; and can transform data into diagrams and vice versa.

Computer Networks

Trainees understand and are able to explain different networking concepts and the topologies, media, devices and protocols as well as their advantages and disadvantages; also know the evolution and development of networks and especially the Internet and can discuss the relevant network standards and protocols in their historical context; and are familiar with the hierarchical, layered structure of typical networks and have competencies to install and test basic LAN devices.

Algorithms and Data Structures

Trainees have competencies of implementation and application of the essential algorithms and corresponding data structures used in computer science. They understand data structures used in storing and data manipulation and are able to study and analyze basic sorting and searching algorithms and their relation to these data structures. Trainees work with complex problems, know how to use those algorithms and write basic efficient algorithms. They also work with different data structures (data types) and know how to choose the appropriate one for a given problem. Trainees therefore have competencies in problem solving methods and basic skills of program design and the implementation of algorithms in programs.

Semester 4

General, Technical and Pedagogical English 4

The trainees continue to develop their ability to interact and communicate through English, using reading, writing, listening and speaking skills. Instruction will aim to broaden and deepen their knowledge of vocabulary, grammar and structure of English in a communicative context related to their vocational discipline and also to their role as trainers. They should move from a more passive understanding of English

to active use in written texts and oral presentations. The goal will be to raise the general level of ability to between B1 and B2 on the Common European Framework scale.

Operating Systems

The trainees present the basics and principles of modern operating systems and they are able to distinguish between the design and features of the major and Open Source operating systems; and know and identify different concepts of operating systems - including system organization for processors, processes and threads, CPU scheduling algorithms, deadlocks, memory management and paging, file system management, I/O systems, protection and security, and mass storage. Additionally the trainees have competencies for the design and implementation of programs dealing with some of the operating system concepts as well as Open Source operating systems - programs to be written in high level programming languages such as C/C++.

Software Engineering

The trainees are able to explain the purpose and duties and the principles and practices of software engineering. The topics include software quality concepts, process models, software requirements analysis, design methodologies, software testing and software configuration management. The trainees therefore have the knowledge to produce and realize systems and software, a quality manual and project and quality plans; have also hands-on experience in building a software system using one of the modern software engineering paradigms such as UML; understand the stages of software life cycle, methods of software design and test and they are able to write documentation for software products; have competencies of applying Case Tools on real environment; and can work in teams also to develop all life cycle deliverables, specification document, design documents, system code, test plan, and user manuals.

Database Management Systems

The trainees understand and describe the concepts and architectures of database management Systems (DBMS). They gain the knowledge and skills for a complex project work to design, build and implement a database application for a given business activity. The skills of the trainees therefore include competencies to use database development tools and modeling techniques and to designing database systems based on alternative approaches; for example, object oriented, distributed databases and database interfaces and languages. Trainees know also the language and syntax of SQL and they can use the concepts of database administration, of recovery and concurrency as well of database maintenance.

Semester 5

General, Technical and Pedagogical English 5

The trainees continue to develop their ability to interact and communicate through English, using reading, writing, listening and speaking skills. Instruction will aim to broaden and deepen their knowledge of vocabulary, grammar and structure of English in a communicative context related to their vocational discipline and also to their role as trainers. They should move from a more passive understanding of English to active use in written texts and oral presentations. The goal will be to raise the general level of ability to between B1 and B2 on the Common European Framework scale.

Information Technology Management

With regard to real information technology orders and projects trainees are able to consult customers and to plan, organize and manage a complete information or communications application project. The projects in the sense of case studies can cover various purposes and duties of software application, database or web sites development, or network development, or information or communication systems development. To the real business and work processes trainees show project management competencies which include e.g. the project integration, scope, time, cost, quality, human resources, communications, risk, and procurement. In addition the trainees are able to use one of the project management tools (e.g., Microsoft Project).

Semester 6

General, Technical and Pedagogical English 6

The trainees continue to develop their ability to interact and communicate through English, using reading, writing, listening and speaking skills. Instruction will aim to broaden and deepen their knowledge of vocabulary, grammar and structure of English in a communicative context related to their vocational discipline and also to their role as trainers. They should move from a more passive understanding of English to active use in written texts and oral presentations. The goal will be to raise the general level of ability to between B1 and B2 on the Common European Framework scale.