Software Technology

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School of Engineering Technology

Bachelor of Science Degree

The Software Technology Program encompasses the technical and professional background needed to customize and apply industry standard software for a wide variety of functions in such industries as business, manufacturing, engineering, and service. As a project intensive and professional practice oriented program, it will focus on the skills and competencies needed to work with and apply the most prominent software in the global market. The program also includes provisions to gain computer hardware and networking skills to function as a computer networking technologist.

The program has been developed in compliance with the ETAC/ABET accreditation criteria. As per the guidelines of the New York State Education Department, the name of the program will change to BS Software Engineering Technology immediately upon receiving ETAC/ABET accreditation.

Typical Employment Opportunities

Software Applications Engineer
Computer Network Technologist
CISCO Computer Network Technologist
SAP Applications Specialist for Materials Management/Supply Chain/Human Resource Management/Quality Control
SAP/ERP Software Configuration Specialist
SAS Software Applications Engineer
Oracle Software Applications
Engineering Design/Manufacturing Graphics Technologist

Software Technology (BS) Program Outcomes:

• Graduates will have the technical skills to customize and apply industry standard software for a wide variety of functions in such industries as business, manufacturing, engineering, and service.
• Graduates will have the technical background in computer hardware and networking skills to function as a computer networking technologist.
• Graduates will exhibit an understanding of the necessity for personal integrity, ethical behavior, cultural awareness and lifelong learning.

Fall 2019 - Subject to Revision

Liberal Arts and Sciences (60 credits)
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### Course Descriptions

#### EGL 101 Composition I: College Writing (GE)
This is the first part of a required sequence in college essay writing. Students learn to view writing as a process that involves generating ideas, formulating and developing a thesis, structuring paragraphs and essays, as well as revising and editing drafts. The focus is on the development of critical and analytical thinking. Students also learn the correct and ethical use of print and electronic sources. At least one research paper is required. A grade of C or higher is a graduation requirement. Note: Students passing a departmental diagnostic exam given on the first day of class will remain in EGL 101; all others will be placed in EGL 097. Prerequisite is any of the following: successful completion of EGL 097; an SAT essay score (taken prior to March 1, 2016) of 7 or higher; an SAT essay score (taken after March 1, 2016) of 5 or higher; on-campus placement testing. Credits: 3

#### EGL 102 Composition II: Writing About Literature
This is the second part of the required introductory English composition sequence. This course builds on writing skills developed in EGL 101, specifically the ability to write analytical and persuasive essays and to use research materials correctly and effectively. Students read selections from different literary genres (poetry, drama, and narrative fiction). Selections from the literature provide the basis for analytical and critical essays that explore the ways writers use works of the imagination to explore human experience. Grade of C or higher is a graduation requirement. Prerequisite(s): EGL 101 Credits: 3

#### PHY 135 College Physics I (GE)
An integrated theory/laboratory general college physics course without calculus. Topics will include fundamental concepts of units, vectors, equilibrium, velocity and acceleration in linear and rotational motion, force, energy, momentum, fluids at rest and in motion, and oscillatory motion. Laboratory problems, experiments and report writing associated with the topics studied in the theory are performed. Prerequisite(s): MTH 129 Corequisite(s): PHY 135L Credits: 4
PHY 136 College Physics II (GE)
A continuation of PHY 135. Topics will include heat, electricity, magnetism, light and optics. Prerequisite(s): PHY 135
Corequisite(s): PHY 136L Credits: 4

MTH 110 Statistics (GE)
Basic concepts of probability and statistical inference. Included are the binominal, normal, and chi-square distributions. Practical applications are examined. Computer assignments using Minitab form an integral part of the course. Prerequisite(s): MP2 or MTH 015 Credits: 3

MTH 116 College Algebra
This course is designed to provide students with a firm foundation in symbolic manipulation and algebraic reasoning. Both manipulative skills and conceptual understanding of algebraic principles are stressed. Topics include equivalent expressions and equations, linear functions, properties of exponents and logarithms, quadratic equations, power functions, exponential functions. Upon completion of this course students will be prepared for precalculus as well as for quantitative courses in the natural and social sciences. Prerequisite(s): MP2 or MTH 015 Credits: 4

MTH 129 Precalculus
In this course, the topics introduced in College Algebra course will be extended. The course will provide a comprehensive study of functions, which are the basis of calculus and other higher-level mathematics courses. The students will study the properties, graphs, and some applications of polynomial, rational, inverse, exponential, logarithmic, and trigonometric functions. Note: Students completing this course may not receive credit for MTH 117. Prerequisite(s): MP3 or MTH 116 Credits: 4

MTH 130 Calculus with Applications
This is a calculus course for those not majoring in Mathematics, Engineering Science or Computer Science. Topics include the derivative, differentiation of algebraic, trigonometric, exponential and logarithmic functions, applications of the derivative and the definite integral. Applications are taken from technology, science, and business. Problem solving is stressed. A graphing calculator is required. Note: Students completing this course will not receive credit for MTH 150. Prerequisite(s): MP4 or MTH 117 or 129 Credits: 4

SET 101 Fundamentals of Software Technology
This course provides students with an understanding of modern software technology such as Operating Systems (OS), Virtual Memory Systems, and Android OS. A distinction is made between modern and legacy operating systems, such as Unix and Windows, in terms of security, network compatibility and usability in the design and development of modern application software. The course addresses issues with utility programs, desktop and mobile applications development, and information systems development essential for the modern corporate world. Elements of multimedia technology, databases basics and database management systems development, apart from computer networks and security are presented. Credits: 3

EET 104 DC/AC Circuits
An introductory course to the fundamentals and basic principles of DC and AC circuits. Topics covered include: The definition of current, voltage and passive circuit elements such as, resistors, capacitors, and inductors, through their I-V characteristic relationships. Ohm's Law Power, Kirchhoff's Current and Voltage Laws, Voltage and Current Divider Rules, and their basic applications in the analysis of series, parallel and series-parallel circuits. The fundamental Network Theorems, Superposition, Thevenin's and Norton's equivalent circuits and Maximum Power Transfer. AS signal waveforms and their Average and RMS value, alternating current, voltage and power resistors, capacitors and inductors in AC circuits, ideal transformers and the concept of resonance. Introduction to the operation and basic applications of first order passive, low and high pass, RC filters. Corequisite(s): MTH 129 Credits: 3
EET 105 Introduction to Digital Electronics
An introduction to the fundamental concepts of Digital Electronics. Topics covered: Number systems, Boolean Algebra, Logic Gates, Combinational Circuits, Karnaugh Map Minimization Techniques, Adders, Signed Numbers, Multiplexers, Code-Converters, Decoders, Encoders, Comparators and 7-segment displays. The laboratory component of the course reinforces the topics covered in the theory through relevant experiments performed by students using logic trainers. Corequisite(s): EET 111 or EET 104 Credits: 2

SET 105 Introduction to Symbolic and Logic Programming
This course introduces students to the basics of programming logic and its real-life applications from a software technology perspective. The design and development of symbolic and logic programming for various computer science structures is a major focus for the course. The languages that support symbolic structures such as LISP and Prolog are covered in the context of the syntax and semantics of these scientific programming languages. Credits: 3

SET 205 Introduction to Artificial Intelligence and Robotics Technology
This course introduces students to the basics and applications of artificial intelligence and robotics. The course covers knowledge representation, autonomous systems, common sense techniques as well as their practical implementation in autonomous driving systems and speech recognition. To enforce the foundational understanding of the subject matter, multi agents with their navigational approaches and topological path planning strategies are presented. Prerequisite(s): SET 101 Credits: 3

SET 220 Internetworking
The course will provide an in-depth understanding of internet and its applications. Lab projects will provide hands-on experience in network configuration, installation and utilization. The topical outline includes the following: internet mechanism, communication on the internet, application of internet, use of search engines, online communication, internet security, hardware for network communication, and control computer networks. Prerequisite(s): EET 104 Credits: 3

SET 230 Wireless Technology and Applications
The course will focus on developing the skills needed to design, build and utilize wireless networks. The topics will include function of a wireless system, basic technologies for wireless, wireless applications, wireless internet, hardware and standards for wireless networks, and building and maintaining a wireless system. Prerequisite(s): EET 104 Credits: 3

SET 310 Software Applications for ERP Solutions
As the first of a sequence of courses, this course will provide an in-depth study of software applications in a variety of industries. Overview of engineering and business processes, concepts in enterprise resource planning and integration, and software applications for such functions as manufacturing, product life cycle management, and supply chain management will form the key topics. The focus of the course is the application, configuration of industry standard software and how to customize it for a variety of applications. Prerequisite(s): BCS 260 Credits: 3

SET 320 Software Applications in Supply Chain Management
The objective of the course will be to develop skills and competencies to plan and implement supply chain management concepts. The primary focus will be to define, configure and apply supply chain management software. Topical areas covered will include vendor- customer roles, enterprise systems, production planning and control, capacity planning, materials requirements planning, purchasing, inventory control, shop floor control, sales and distribution, and warehouse operations and management. Industry standard software such as SAP will be used for configuration, customization and application for Supply Chain Management. Prerequisite(s): SET 310 Credits: 3

SET 400 Network Planning and Implementation
This course will focus on developing skills needed to plan and implement networking systems. As a higher level course, it will prepare the students to design, build and implement a network system. The course assumes that the student will have basic understanding of network requirements, network architecture, security of network systems, selection on network technologies, engineering cost estimation, and project implementation. Laboratory projects will focus on real world experience in networking planning and implementation. Prerequisite(s): EET 440 or BCS 208 Credits: 3

SET 402 Software Applications in Statistical Analysis & Manufacturing Mgmt
The objective of this course is to develop competencies in the application of software for gathering and analysis of information, and preparation of scientific, technological and management reports in such functions as engineering manufacturing, banking, pharmaceutical and regulatory controls. Standard application software such as SAS will be used for analysis and reporting. Prerequisite(s): MTH 110 and SET 310 Credits: 3

SET 405 Software Applications in Manufacturing & Service Functions
The objective of the course will be to develop skills and competencies to apply software for such service functions as quality management and finance, and human resources management in an enterprise. The primary focus will be to define, configure and apply software for service functions in manufacturing and service industries. Industry standard software such as SAP will be used for application customization and configuration. Prerequisite(s): SET 310 Credits: 3

SET 410W Senior Project
This is a capstone course which will require the student to utilize the skills and competencies gained in the program to develop and implement real world projects. With the guidance from the instructor, students may address specific problems in a company or industry and develop solutions involving software applications. Using the skills and competencies gained in software applications, the student will be able to determine research methodologies, selection of a project setting limitations for a project, defining the problem, conducting an industry study, establishing process flow for the configures system, going alive with the new system, turning over the control of the system, and providing maintenance and service support. Note: Students cannot get credit for SET 410 and 410W; SET 410W can be used to fulfill the writing intensive requirement. Note: Offered at the discretion of the Automotive & Mechanical Engineering Technology Department Prerequisite(s): Senior Status and Departmental Approval. Credits: 3

EET 440 Networking & Data Communications
This course covers the basic concepts of networking and computer connectivity. Several network topologies and related media access techniques are explored. The rudiments of Data Communications and Open System Interconnection (OSI) are discussed in detail. Students will learn the components of a client server networks using the Novell’s Net Ware/ Intra Net Ware. Certain protocols such as TCP/IP and SPX/IPX are also discussed. Laboratory experiments are designed to give students a hands on experience in Network administration, configuration and resource management. Completion of this course includes a final project related to the design of a local area network, complete with Layers I and II, as well as the Directory Tree Structure based on the netware. An oral presentation by each student of his/her project is required. Prerequisite(s): Knowledge of digital electronics; familiarity with a real time operating system; ability to program in a high level language. Chair approval. Credits: 4

EET 441 Advanced Networking
This course is a continuation of EET 440, Networking and Data Communications. The principles of Architecture Layering, Multiplexing and Encapsulation are discussed. TCP/IP, IPX, PPP, ISDN and Frame Relay Protocols are covered. Network equipment such as repeaters, bridges router hubs and switches are studied in detail. Equipment examples are drawn from key vendors such as CISCO, 3COM and Cabletron. The laboratory portion of the course will concentrate on experiments and projects designed using CISCO Systems networking equipment, such as 2500 and 2600 series routers, 1900 and 2900 catalysts switches. The students will also learn how to design networks using VLANS on the above mentioned equipment. Prerequisite(s): EET 440 Credits: 4
BCS 120 Foundations of Computer Programming I
This course introduces the C++ Programming Language as a means of developing structured programs. Students will be taught to develop algorithms using top-down stepwise refinement. Students will be introduced to the concept of Object Oriented programming. In addition, students will get a thorough exposure to C++ syntax and debugging techniques. Credits: 3

BCS 230 Foundations of Computer Programming II
This course expands the knowledge and skills of Foundations of Computer Programming I. Among the topics covered are: arrays, pointers, strings, classes, data abstraction, inheritance, composition and overloading. Prerequisite(s): BCS 120 with a grade of C or higher Credits: 3

BCS 345 Java Programming
This course is designed for students with some experience with programming. The syntax of the Java programming language, object-oriented programming, creating graphical user interfaces (GUI), exceptions, file input/output (I/O), and how to create Java applications and applets will be covered. Prerequisite(s): BCS 230 with grade of a C or higher. Credits: 3

BCS 260 Database
This course provides the fundamental knowledge of database concepts. Topics studied will include the history and advantages of database systems, and the process of database design including entity-relationship diagrams and database normalization. Students will have hands-on experience using SQL (Structured Query Language). Prerequisite(s): BCS 120 and BCS 160 all with a grade of C or higher Credits: 3

BCS 301 Systems Analysis and Design
This course explores the major issues in the analysis and design of a system, including methods of data collection, information requirements analysis, and the analysis process are discussed. Emphasis is placed on the importance of the user in the design process and focuses on approaches that improve the successful implementation of a computer system. Topics include general systems theory, Systems Development Life Cycle, data flow diagrams, data dictionary, hardware and software evaluation, feasibility analysis, CASE tools and prototyping. Students are required to demonstrate their skill in using project management and diagramming application software. Note: Credit cannot be given for both BCS 265 and BCS 301. Prerequisite(s): BCS 120 with a grade of C or higher and Junior Level Status. Credits: 3

Admission to Farmingdale State College - State University of New York is based on the qualifications of the applicant without regard to age, sex, marital or military status, race, color, creed, religion, national origin, disability or sexual orientation.