Endicott College of International Studies

Course Descriptions

Core Technology Studies (Required)

All Endicott Students take part in general education courses to ensure a solid foundation for their learning, and provide ongoing support through graduation.

TECH 101	Foundations of Computer Science 1	3 Credits
The purpose of this course is to teach foundations of computer systems. This course covers concepts of hardware, software, computation theory, and applied computation processes. Students will work with operating systems (Windows, Linux), command line, and some basic coding.		

TECH 201	Foundations of Computer Science 2	3 Credits
Building on TECH 101, students delve deeper into computer systems, and begin developing their coding skills and knowledge. The course introduces the fundamental concepts of object oriented programming. Topics include: Fundamental constructs - data types, arrays, strings and string processing, files, variables, expressions, conditionals, iteration, simple I/O. Object oriented fundamentals - methods, classes, interfaces, inheritance Algorithms and problem solving - problem solving process and strategies, simple searching and Sorting algorithms (linear and binary search, selection and insertion sort) Software development tools and techniques - testing: black box, requirements, unit Machine level representation - bits, bytes, words, number bases, representation of data, memory management.		

TECH 202	Contemporary Internets: People, Data, Services, Things	3 Credits
While many consider the internet to be a single technology, the reality is far more complex. In fact, there are at least four distinct conceptual lenses that can be used to understand the ways the internet functions. This course explores the Internet's impact on commercial and personal dynamics. A review of current literature will examine such issues as: changes in workplace productivity, legal issues arising from company Internet use policy, enterprise morale in the face of nearly ubiquitous Internet access, institutional liability for employee conduct while on the net, and the blurring of the line between "home" and "work." Since the Internet is both in the workplace and at home, family, personal, and other non-workplace issues will also be explored		

TECH 203	Introductory Programming	3 Credits
Moving beyond the concepts learned in TECH102, this course covers broader and deeper fundamentals of computer programming. Students will encounter key terminology, the variety of available programming languages, and the uses to which they are put. The course covers the C programming language, including topics such as designing program flow diagrams and algorithm design, basic data types, mathematical and logical operations, program control statements, loop statements and arrays.		

TECH 301	Advanced Concepts in Computer Science	3 Credits
This course builds on previous computer science courses and prepares students to take a hands-on approach to industry 4.0 technologies. Topics include computer organization, data structures and abstractions, programming methodologies, distributed and parallel computation, areas of application, and database systems. This course introduces students to the basic concepts of digital systems, including analysis and design. Both combinational and sequential logic will be covered. Students will gain experience with several levels of digital systems, from simple logic circuits to programmable logic devices and hardware description language. Course includes a project component.		

TECH 302	Data Analytics	3 Credits
Organizations have access to greater amounts of data than ever before. This course deals with the practical issues of storage, navigation, use, and presentation of massive datasets. It provides the foundation for advanced applications, such as data mining.		

TECH 303	Smart Manufacturing: Connectivity, autonomy, and production	3 Credits
This course aims to introduce students on the power of digital manufacturing and design technologies, particularly how product data can seamlessly transfer through the entire lifecycle of a manufactured product.		

TECH 304	Mathematics for Programming	3 Credits
In many ways, mathematics is the common language of computer science. This course provides the mathematic foundation necessary for many aspects of computer science. Students will learn logic, abstract algebra, set and graph theory, and more. As an intermediate level mathematics course, students must have basic mathematic skills to take this course.		

TECH 305 Cyber Security **3 Credits**

No organization can afford to ignore the threats presented by malware, hackers, and other ill-intentioned elements of the modern digital ecosystem. In this course, students will learn basic principles and skills of cyber security. Course topics include security management, vulnerability analysis, security tools and applications, and damage control.

TECH 401 Java **3 Credits**

This course covers Java programming, control structures, functions, arrays, pointers and strings, classes and data abstraction, operator overloading, inheritance, virtual Functions and polymorphism, Java stream input/output, templates, exception handling, file processing, data structures, bits, characters, strings and structures, the preprocessor, class string and string stream processing, standard template library (STL), standard Java language additions.

TECH 402 Human Computer Interaction **3 Credits**

This course will provide students with a sound introduction to the discipline of HCI and examine the issues of human factors and the design of computer application interfaces. The course will have a more psychological and social focus rather than a technical one. It will be organized around a collection of readings and real-world exercises concerned with applying HCI research to the design of computer interfaces.

TECH 403 Technology Foresight and Forecasting **3 Credits**

This course examines the methods used in forecasting technological advances and assessing their applicability in the commercial world. The course will stress the broad macro-level economic issues such as competition, positioning of the technology in the market and further research to apply the innovation to useable products.

Management Electives

TECH 204A	Digital Media Content and Development	2 Credits
This course explores branded content strategies across multimedia platforms (social media, web, e-campaigns, and mobile media). Students will be introduced to frameworks and practices on content creation, strategy, and performance analysis.		

TECH 204B	Digital Design and CAD	2 Credits
This course introduces the techniques of digital modeling, including 3D modeling and rendering. Students will learn the basics of CAD, and design principles for modeling 3D objects in digital environments.		

TECH 204C	History of Technology	2 Credits
This course provides an introduction to the history of technology and surveys major technological developments from ancient to modern times with particular attention to social, political, and cultural contexts all around the world. Students will also think critically about the theory of technological determinism, the ways in which technology has defined “progress” and “civilization”, and the major ethical considerations surrounding today’s technological decisions.		

TECH 204D	Problem Analysis and Technological Solution	2 Credits
In the past few decades, psychologists and management specialists alike have discovered that successful problem solvers tend to use the same type of process to identify and implement the solutions to their problems. This process works for any kind of problem, large or small. This course will give participants an overview of the entire creative problem solving process, as well as key technological problem solving tools that they can use every day.		

TECH 204E	Introduction to Linux	2 Credits
While most of the world is content to use Windows and IOS, there is a third option for those who are willing to take the road less travelled. The open source OS Linux has many builds, but a key set of competencies. In this course, students will learn about the advantages and disadvantages of Linux, distinguish between the various versions available, learn about Linux command line and troubleshooting, and ultimately acquire the skills they need to make use of this free, empowering, but sometimes aggravating resource.		

TECH 306A	Do It Yourself Technology Culture	2 Credits
While many consider technology to be the product of well-funded corporations and cutting edge laboratories, it's important to remember that the first Macintosh computer was created in a home garage. This course explores the unpredictable, maverick, egalitarian, and populist world of DIY technology. Topics include the open-source movement, the Maker movement, and Hacker culture.		

TECH 306B	Prototyping	2 Credits
In this course, students will engage with a wide variety of prototyping techniques for making their ideas a reality. The course covers a broad field of prototyping techniques, and includes a short final project in which students prototype their own project, using techniques they explored during the course.		

MGMT 306C	User Psychology	2 Credits
This course is about people and how they use, create and distribute technology and the impact it has on them and the world at large. It is about how people think and feel and why they do things. User psychology is about understanding what people want and need in order to help them create and use media to get more done, do things better and live more fulfilling lives.		

INTL 306B	Industry 4.0 and Development	2 Credits
What are the challenges for developing nations in an increasingly technology-dominated economy? Can the development of emerging technology sectors change the balance of geopolitics and create new regional powers, or will the problem of the commodity trap be too great to overcome? What role can new technological solutions play in assisting economic development around the world, and to raise people out of poverty? These questions and more will be explored in this module.		

TECH 306D	Technology and Society	2 Credits
In the history of technology, there are competing narratives about why we have the technologies we have, and how the world is changed by technology. The relationship between technological development and the cultures (and sub-cultures) of people that use technologies is complex and intriguing. This course explores competing theories of technology and society, following case studies of particular technologies as they were developed and appropriated by various societal groups for their own needs. Understanding this phenomenon is crucial for technological innovators who wish to understand how their work might ultimately be adopted.		

Technology Studies Concentrations

Technology Management

MGMT 101	Introduction to Management	3 Credits
This is a core unit in management studies. This unit will provide students with a solid framework required for further studies in management. The unit provides the students with the nature of managerial work in organizations, historical development of management theories, contemporary issues and practices relating to managing organizations effectively and efficiently. Students will be able to develop foundational knowledge and skills required by the managers in organizations to perform their roles and functions in order to achieve organizational goals. On successful completion of this unit students will be able to describe how planning, organizing, leading and controlling can be managed in organizations for effective decision making. These insights will enable students to identify their role as future managers to critically analyze the individual or organizational operations in the light of making contributions to creating value at both an individual and organizational level.		

MGMT 304	Strategic Management	3 Credits
Strategic management involves the formulation and implementation of the major goals and initiatives taken by a company's top management, based on consideration of resources and an assessment of the internal and external environments in which the organization competes. This course is designed to undertake a study into Strategic Management concepts and techniques which are based on the tools of strategic analysis, business-level strategies and corporate-level Strategies. These concepts and techniques will help students to gain knowledge which is essential for managers operating in current dynamic professional environment to successfully perform their day-to-day management responsibilities in order to achieve their organizational goals.		

MGMT 305	Operations Management	3 Credits
The preliminary aim of this course is to provide students with the basic skills of analyzing and improving management processes. This can applied both in services and manufacturing. Another key aspect of the course is increasing productivity tools, along with delivering higher quality standards. After successfully completing this course, students will be familiar with such concepts as (but not limited to) process analysis, bottlenecks, flows rates, and inventory levels to a real-world professional challenge.		

TECH 307 Strategic Technology Analysis	3 Credits
The course focuses on the factors strongly impacting the success of new computing and communications products and services in commercial applications. Students will learn about technology trends and limits, economics, standardization, intellectual property, government policy, and industrial organization. Students will concentrate on strategies to manage the design and marketing of successful products and services.	

TECH 308 Data Mining	3 Credits
It has never been easier to collect vast amounts of data on customer and employee actions, creating the need of a way to make sense of this massive amount of information. Data mining is the use of programs and algorithms to find meaningful patterns and information in large amounts of data. In this course, students learn foundational data mining concepts and skills. Course topics include data mining problems and solutions, types of data mining, and key algorithms. Students will apply their knowledge on real data sets using established data mining techniques.	

TECH 309 Technology Entrepreneurship	3 Credits
This course is designed for students interested in learning about the fundamental issues related to starting and managing technology-based new ventures. The course encourages students to consider how technology-based solutions can solve economic and socially oriented problems.	

MGMT 402 Human Resources Management	3 Credits
With a focus on emerging industry this course is designed to undertake a study into modern human resource management concepts and techniques in general. The unit assists to identify a range of essential Human Resource Management tools and skills. They are not only essential for managers operating in current dynamic organizational environment to successfully perform their day-to-day management responsibilities but also to successfully achieve the organizational goals. Upon completion of this course students will be able to critically analyze and identify how an effective manager should select, organize, assign tasks, motivate and reward employees to achieve optimal results for their organizations.	

MGMT 310 Organization, Innovation, and Technology	3 Credits
Every organization is a technology organization: Starbucks Coffee – from casual cafe to a leader in mobile payments; FedEx – from trucking and shipping to data analytics and powerhouse, and Amazon – from book seller to warehousing, cloud service, and media. In this course, students will explore the intersection of technology innovation and commerce to better serve the needs of the customers to gain competitive advantage.	

TECH 404 Cyber-Security Management	3 Credits
The course was developed based upon the evolving effects of cyber security in today's world and because of the fast technological pace of never ending resources and technology innovations that makes an adversarial threat more frequent to various types of cyber-attacks and risk analysis. Students will explore and understand the various methodologies across all industries on how to conduct and manage a cyber-security assessment, risk analysis and how to mitigate various cyber security threats. The objective of this course will also enable students to explore current cyber policy issues both in private and the public sectors and their implementation.	

Tech 405 Technology Research and Development	3 Credits
Students will be able to identify seminal and cutting-edge topics in computer science, distinguish research topics from technology tasks, know how to go about evaluating the novelty and contribution of a research idea, coordinate groups with various responsibilities and expertise, and bring a project through cycles of development to make it a reality.	

Tech 406 Technology Brand Management	3 Credits
Students get an overview of how to identify and establish brand positioning and values in technology. Marketing campaigns to build brand equity are discussed and different branding strategies are introduced. Moreover, students develop an understanding and a feeling for design of Technology Corporate Brands in an innovation context.	

Tech 407 Accounting and Management Technologies	3 Credits
The study of accounting information systems is, in large part, the study of the application of information technology (IT) to accounting and management. The main reason to study this course is a special career opportunity that will enable to combine technology studies with the interest in accounting and management. In the course will be used some elementary notions and operations of matrix algebra adapted to the solution of accounting problems and to the formation of accounting reports. Such an approach to the description of the material is helpful in understanding the basic notions of accounting technology.	

Advanced Technologies

TECH 308 Electrical Engineering 1: Analogue Circuits	3 Credits
All modern technologies, from toasters to large hadron colliders, have something in common: electrical circuits. In this course, students learn the basic theory and principles of electrical circuits. In a culminating project, students build their own functional circuits.	

TECH 309 Data Communications and Networking	3 Credits
Knowledge of data networking and communication is a fundamental necessity for anyone moving into a career in technology. This course will cover networking architecture, routing, and protocol, looking at both local and wide area networks. This course covers both theory and application.	

TECH 310 Applied Internet of Things	3 Credits
The Internet of Things represents a new paradigm in consumer and industrial technologies that is unfolding at a rapid pace. In this course, students will engage with the IoT on a theoretical and practical level. Students will become familiar with key concepts, affordances, and dangers associated with IoT, as well as the underlying technologies and software structures that enable it to exist. Through exercises and projects, students will apply this knowledge firsthand.	

TECH 311 Electrical Engineering 2: Digital Electronics & Microcontrollers	3 Credits
Building on knowledge of analogue circuits, students move into the complex world of digital electronics. Here, physical circuit construction is combined with rudimentary programming to accomplish a wide array electronic affordances. Students will work with introductory micro-controllers, with teams creating showcase projects.	

TECH 312 Software Development	3 Credits
In this course, students learn about the cycle of software development, including systems analysis, preliminary and detailed design, implementation, testing, and maintenance.	

Tech 410 Web Development	3 Credits
Websites have become commonplace in our personal and professional lives. While many “ready-made” website publication tools exist, this course gives students the skills to design, implement, and maintain websites at a fundamental level. Topics include HTML, Javascript, CSS, web hosting, and publication, and principles of design. Students will create their own websites.	

TECH 411 IT Infrastructure Protection 3 Credits

While most networks and digital resources are worthy of protection, some are so valuable that they must be protected at all costs. This course covers infrastructure design and protection, cryptography, and other advanced techniques and concepts.

TECH 412 Advanced Programming 3 Credits

This terminal course in programming is a mix of advanced programming concepts, independent research, and project based learning. Previous programming concepts will be reinforced and expanded, and students will pursue their own direction of inquiry based on their specific professional goals.

TECH 413 Graphic System Development 3 Credits

Not everyone is willing to interact with software via command line. This course provides students with the skills they need to work with and develop graphic user interface (GUI) systems. This includes considerations of software design, graphic design, and user experience testing.

TECH 414 IoT and Cyber Security 3 Credits

For all of the positive potential presented by IoT technologies, it is becoming clear that there are undeniable vulnerabilities as well. In this course, students will combine their understanding of IoT and Cyber Security to position themselves as solutions to this potential threat. Topics include design vulnerabilities in IoT, potential responses and remedies, and case studies in IoT malware, botnets, and DDOS attacks.

TECH 415 Virtual and Augmented Reality 3 Credits

This course cover implementation and application of both virtual and augmented reality technologies. Students will learn how to design for these technologies, what has been done with them, and what might be accomplished with them in the future.

TECH 416 Advanced Cyber Security and Vulnerability Assessment 3 Credits

This course goes beyond basic-cyber security to examine social, legal, and political implications of cyber-security and threat on the world stage. The course presents contemporary issues of security through case studies and current readings. Students will be prepared to follow current trends in cyber-security and anticipate future threats. Students learn to approach digital infrastructures holistically and systematically to identify security vulnerabilities and rectify them. Students will learn and apply principles by assessing real infrastructures.

TECH 417 Smart Technology Design	3 Credits
By combining knowledge of electrical engineering, programming, networking, and IoT, students will be positioned to design “smart” technologies allowing for applications such as home automation and web-based communication. Students will collaborate to consider not only the technical aspects of product design, but also consumer-oriented aspects as well.	

Advanced Automation

TECH 308 Electrical Engineering 1: Analogue Circuits	3 Credits
All modern technologies, from toasters to large hadron colliders, have something in common: electrical circuits. In this course, students learn the basic theory and principles of electrical circuits. In a culminating project, students build their own functional circuits.	

TECH 311 Electrical Engineering 2: Digital Electronics & Microcontrollers	3 Credits
Building on knowledge of analogue circuits, students move into the complex world of digital electronics. Here, physical circuit construction is combined with rudimentary programming to accomplish a wide array electronic affordances. Students will work with introductory micro-controllers, with teams creating showcase projects.	

TECH 313 Information Systems Analysis and Development	3 Credits
Cogent analysis of information systems is a crucial part of the development and refinement process. In this course, students learn principles of IS analysis and apply them to real world cases. These skills will be of use in the fields of software development, IT management, and consulting.	

TECH 314 Additive Manufacturing	3 Credits
Additive manufacturing is being implemented on many scales, from desktop home-made 3D printers to large scale industrial systems. Students will learn about the techniques and applications of additive manufacturing, covering different processes, materials, and applications.	

TECH 315 Automatic Control Systems	3 Credits
Manufacture and production processes are becoming more reliant on automation. Students learn the principles and functions necessary to participate in the design, maintenance, and operation of automatic control systems. Content includes simulation, various systems, and autonomous systems analysis.	

Tech 316 Engineering Mechanics and Application	3 Credits
Students will learn basic engineering mechanics and applications involved in product design and manufacturing processes	

TECH 418 Robotics and Intelligent Systems	3 Credits
This course introduces students to principles of robotics, including history, practical engineering, and hardware/software considerations. Students will employ these principles in group robotics projects.	

TECH 419 Sensors and Input Data	3 Credits
This course covers the variety of sensors used in robotics, automation, and IoT, the varieties of data that emerge from these sensors, and how this data can be employed.	

TECH 420 3D Modeling and CAD	3 Credits
Students will learn advanced techniques in computer-aided drafting and 3D modeling, developing functional, complex, multi-part objects that can then be produced through additive manufacturing and other processes.	

TECH 421 Product Design and Fabrication	3 Credits
This course provides students with the skills they need to bring a product from concept to mass production. Attention will be paid to various stages of the industrial production cycle, and different paradigms of manufacturing currently being employed.	

TECH 422 Manufacturing Systems	3 Credits
This course familiarizes students with theory and application of multi-stage complex manufacturing process and organization. Students will study multiple models of manufacturing, complete with case studies from leading manufacturers.	

TECH 423 Robotics Engineering 3 Credits

This course goes beyond basic-cyber security to examine social, legal, and political implications of cyber-security and threat on the world stage. The course presents contemporary issues of security through case studies and current readings. Students will be prepared to follow current trends in cyber-security and anticipate future threats. Students learn to approach digital infrastructures holistically and systematically to identify security vulnerabilities and rectify them. Students will learn and apply principles by assessing real infrastructures.

TECH 424 Automated Manufacturing 3 Credits

Students will draw on knowledge from previous courses (robotics, sensors, automated systems, manufacturing systems, networking), combining elements to understand the processes, requirements, and capabilities of autonomous manufacturing systems.

TECH 425 Smart Factory Systems 3 Credits

Automation has had a massive impact in the manufacturing sector. Students will learn about trends and developing technologies being employed in factories, and the ways these relate to cloud computing, data analytics, and IoT technologies.

Advanced Intelligence

TECH 318 Algorithms 3 Credits

This course introduces the fundamental mathematics, concepts, and techniques, and applications of algorithms and algorithm design. Students will encounter many varieties of algorithms, and learn how to create and employ algorithms as a core component in larger, more complex projects.

TECH 319 Theories of Computation 3 Credits

In this course, students bring computation from an abstract theoretical level to modern applications and beyond. Topics include theoretical principles of computing, formal logic, and developing technologies such as quantum computing.

TECH 307 Data Mining **3 Credits**

It has never been easier to collect vast amounts of data on customer and employee actions, creating the need of a way to make sense of this massive amount of information. Data mining is the use of programs and algorithms to find meaningful patterns and information in large amounts of data. In this course, students learn foundational data mining concepts and skills. Course topics include data mining problems and solutions, types of data mining, and key algorithms. Students will apply their knowledge on real data sets using established data mining techniques.

TECH 410 Web Development **3 Credits**

Websites have become commonplace in our personal and professional lives. While many “ready-made” website publication tools exist, this course gives students the skills to design, implement, and maintain websites at a fundamental level. Topics include HTML, Javascript, CSS, web hosting, and publication, and principles of design. Students will create their own websites.

TECH 426 Cloud 1: Application and Architecture **3 Credits**

Cloud computing has become ubiquitous in many social and professional environments. This course will introduce students to the theory and application of cloud computing. This takes a practical, applied approach.

Tech 427 Analytics Programming **3 Credits**

This course builds on data analytics, giving students experience with advanced analytics skills and applications.

TECH 428 Data Visualization and Analysis **3 Credits**

This course prepares students to present and communicate the results of their work in a way that is comprehensible and convincing to those without technical or data science backgrounds.

TECH 429 Principles of Artificial Intelligence **3 Credits**

Artificial intelligence is all around us, and is growing more intelligent every day. In this course, students will learn about the problems and specifics underlying the execution of artificial intelligence. Topics include logic and machine reasoning, representation, pattern recognition, and practical application.

TECH 430 Advanced Data Science **3 Credits**

This course introduces students to advanced concepts and techniques in data science, such as stochastic gradient descent, and quasi-Newton methods.

TECH 431 Machine Learning **3 Credits**

Building on knowledge of artificial intelligence, students will encounter the next level of AI: Machine learning. This course covers the cutting edge theory and application of AI that is able to process vast amounts of information in order to refine its own processes and algorithms.

TECH 432 Cloud 2: Security and Privacy **3 Credits**

This course goes beyond the workings of cloud computing to examine the ramifications and vulnerabilities of this technology. Consideration is given to yet untapped potentials in this technology and yet undiscovered threats.

TECH 412 Advanced Programming **3 Credits**

This terminal course in programming is a mix of advanced programming concepts, independent research, and project based learning. Previous programming concepts will be reinforced and expanded, and students will pursue their own direction of inquiry based on their specific professional goals.