

INFORMATION TECHNOLOGY (INFO)

This is a list of the Information Technology (INFO) courses available at KPU.

Enrolment in some sections of these courses is restricted to students in particular programs. See the Course Planner - kpu.ca/registration/timetables - for current information about individual courses.

For information about transfer of credit amongst institutions in B.C. and to see how individual courses transfer, go to the BC Transfer Guide bctransferguide.ca

INFO 1111 (formerly CISY 1105) 3 Credits **Introduction to Computer Hardware and Software**

Students will learn general computer hardware and software concepts. They will study the general architecture of the computer and examine hardware components such as microprocessors, memory, motherboards, expansion buses, power supplies, hard disk drives, removable media, peripherals, input/output devices, video, audio, and network interface cards. They will compare differences between hardware used in enterprise, personal and mobile computing devices. Students will also study the functions of operating systems and device drivers and will be provided an overview of popular application software.

Attributes: PATH-2

INFO 1112 3 Credits **Principles of Program Structure and Design I**

Students will learn the fundamental logic and structure of computer programs. They will develop skills in different aspects of the problem-solving and programming process including analyzing requirements, designing solutions, coding, testing and writing documentation with emphasis on structured programming and modular design techniques. Students will be required to design and implement a software application.

Prerequisites: Level E1 as defined in the Math Alternatives Table

INFO 1113 (formerly CISY 1212) 3 Credits **Systems Analysis and Design**

Students will study current strategies, methodologies and techniques of systems analysis and design with an emphasis on the role of systems analysts in an organization and collaboration within the overall process. Students will learn how to elicit general information system requirements, perform object-oriented system analysis and design, and generate user documentations. Students working in groups will analyze and design small information systems using object-oriented methodology. Students will examine from an ethical perspective issues specific to information technology professionals, such as intellectual property, access, security and protection of private information, and codes of conduct.

Prerequisites: Level E1 as defined in the Math Alternatives Table

INFO 1211 (formerly CISY 1213) 3 Credits **Operating Systems Principles And Applications**

Students will learn the fundamentals of operating systems and system utilities. They will study the internal structures and operating principles common to all computer operating systems including processes, threads, memory management, file systems, and input/output systems. They will examine common multi-user, multi-tasking operating systems such as Windows, UNIX and Linux.

Prerequisites: INFO 1111 and Level E1 as defined in the Math Alternatives Table.

INFO 1212 (formerly CISY 1215) 3 Credits **Networking Technologies I**

Students will learn the fundamental architecture, functions and components of computer networks. They will build local area networks with routers and switches and implement Internet Protocol (IP) addressing schemes.

Prerequisites: INFO 1111 and Level E1 as defined in the Math Alternatives Table.

INFO 1213 (formerly CISY 1218) 3 Credits **Web Application Development**

Students will learn the operating principles of the World Wide Web and its relationship with the Internet. They will learn the client-server model, Internet protocols, domain names and URLs, websites and Web hosting. They will also learn HTML, CSS, JavaScript and XML. Students will program both in client and server-side environments and develop data-driven Web applications. They will also learn to deploy applications on web hosting servers.

INFO 1214 3 Credits **Discrete Mathematics for Information Technology**

Students will learn the basic mathematical concepts which form the foundations of computing systems. They will be able to apply mathematical logic and methods to software development. They will learn the principles and applications of discrete mathematics, data organization and data representation.

Prerequisites: Level E1 as defined in the Math Alternatives Table.

INFO 2311 3 Credits **Networking Technologies II**

Students will learn the operation details of routers and switches in small to medium size computer networks. They will acquire skills for configuring and troubleshooting routers and switches. They will also develop skills in resolving common issues which exist when routing between different protocols.

Prerequisites: INFO 1212

INFO 2312 (formerly CISY 2314) 3 Credits **Database Management Systems**

Students will learn the concepts and theory of database models, with particular emphasis on the relational model. They will learn and practice database designs utilizing Entity-Relationship Modeling, functional dependencies, and database table normalization. Students will learn Structured Query Language (SQL) and use SQL statements to design, query and maintain databases.

Prerequisites: INFO 1112 and INFO 1113

INFO 2313 (formerly CISY 2411) 3 Credits
Object-Oriented Programming

Students will learn the principles and concepts of object-oriented programming. They will learn class definition, objects, object interaction, inheritance, polymorphism, interface, abstract classes, and exception handling. They will also learn event-driven programming and object-oriented analysis and design.

Prerequisites: INFO 1112

INFO 2315 (formerly CISY 2315) 3 Credits
Data Structure

Students will learn the data structures and associated algorithms commonly used in system development. They will learn Application of Linked Lists, Stacks, Queues, Binary Trees, Balanced Trees, Searching of Trees, Lists, Inverted Lists, Multi-lists and Graphs. These are the fundamental tools available for contemporary programming languages for implementation of complex algorithms.

Prerequisites: INFO 2313

INFO 2411 3 Credits
Foundations of Computer Security

Students will learn fundamental concepts, theories, methodologies and techniques of computer and network security. Students will gain an understanding of the importance of security within and between organizations, including the ongoing threats and vulnerabilities on networks. In this course the significance of being ethical is emphasized. It covers the aspects of systems security from the perspective of providing security mechanisms for protecting networks. Students will learn several software tools and techniques related to computer security using mechanisms such as cryptographic systems, authentication and access control methods. Different types of network and computer attacks are studied. Tools to discover network designs, functionality, resources and vulnerabilities are introduced.

Prerequisites: INFO 1112 and INFO 1212

INFO 2412 (formerly CISY 2414) 3 Credits
Management of Information Systems

Students will learn information system management in the global economy. They will learn how to plan information systems and design corporate information technology architectures. Students will also learn how to manage corporate information resources and how to select technologies for developing effective information systems. They will be introduced to issues in managing systems that support knowledge-based work and managing information system security.

Prerequisites: INFO 1113

INFO 2413 (formerly CISY 2415) 3 Credits
System Development Project

Students will work on real-world computer information system projects on a team basis. They will integrate computer and system concepts learned in the first two years of the program to analyze project requirements, design and implement a software based information system using appropriate tools.

Prerequisites: All of (a) INFO 2312 (b) INFO 2313 and (c) 15 credits from courses in INFO at the 1100 level or higher

INFO 2416 (formerly INFO 3160) 3 Credits
Server Operating Systems

Students will learn the principles, techniques and strategies used in planning, installing, testing, and administering a server operating system. Students will learn to create and manage user accounts using Active Directory, and to install and configure server roles including Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS), printer server, Internet Information Services (IIS), and Virtual Private Network (VPN). Students will be required to plan, design, and install an application server to simulate real-world scenarios. Students will have hands-on experience in installing, troubleshooting, fine-tuning, and administering a server operating system.

Prerequisites: INFO 1211 and INFO 1212

INFO 3110 3 Credits
Professional Communications in Information Technology

Students will address the activities and techniques for developing proposals, specifications, user guides, reports, memoranda, executive summaries and other documentation commonly used in information technology. Students will present a variety of individual and group written and oral communication assignments, reflecting current Information Systems models.

Prerequisites: All of (a) CMNS 1140 (b) ENGL 1100 and (c) 9 credits from courses in INFO at the 2000 level or higher

INFO 3120 3 Credits
Web Programming with Java

Students will learn the syntax, resources and utilities package of Java related to web applications. Students will also examine web design principles, apply their knowledge to construct web components, including Java Server Pages (JSP), Servlets and JavaBeans for both Internet and Intranet environments, and implement dynamic web applications using a Java web server and a relational database management system.

Prerequisites: 30 credits from courses at the 1100 level or higher, or permission of the instructor.

INFO 3135 3 Credits
Advanced Web Application Development

Students will learn PHP and MySQL and use them to develop dynamic, secure and commercially usable websites. They will learn the basics of PHP and MySQL and will also learn how to access the data in a MySQL database through the Web using PHP. The students will be able to develop shopping carts and Web forums using PHP and MySQL.

Prerequisites: All of (a) 6 credits from courses in INFO at the 2000 level, (b) INFO 1213 and (c) INFO 2313 or CPSC 1204

INFO 3150 3 Credits
Object-Oriented Software Engineering

Students will learn the methods of identifying system requirements and producing object models and designs based on the requirements. They will learn the concepts of Unified Modeling Language (UML). They will identify use cases and expand them into object-oriented designs. Students will use the concepts of software engineering to analyze, design and implement software systems. The students will also be introduced to the concepts of Agile Software Development.

Prerequisites: All of (a) 6 credits from courses in INFO at the 2000 level and (b) INFO 2313 or CPSC 1204

INFO 3160 (formerly INFO 4220) 3 Credits
Network Operating Systems

Students will learn the principles, techniques and strategies used in planning, installing, testing, and administering a server operating system. The course covers creating and managing users using Active Directory, installing and configuring Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS), Printer Server, Internet Information Services (IIS), Web Server, and a Virtual Private Network (VPN). Students will be required to plan, design, and install an application server simulating real-world scenarios. Students will have hands-on experience in installing, troubleshooting, fine-tuning, and administering a server operating system.

Prerequisites: Acceptance into Bachelor of Technology in Information Technology

INFO 3171 (formerly INFO 3170) 3 Credits
System Security

Students will learn fundamental concepts, theories and practical skills of system security. This course covers vulnerabilities of operating systems and covers how systems can be penetrated. Students will learn digital data integrity to ensure the data is unchanged. It also covers data security, network security, web server security and web application security. Tools to discover network designs, functionality, resources, and vulnerabilities are introduced. Security mechanisms for protecting networks are evaluated and security planning is considered. In this course the significance of being ethical is emphasized.

Prerequisites: INFO 2411 and 6 credits from courses in INFO at the 2000 level

INFO 3180 3 Credits
Wireless Networks

Students will learn the concepts and practical skills of wireless local area networks (WLANs). They will learn the fundamentals of radio frequency (RF) signals, mathematical skills required in RF signal power calculations, wireless antennas, antenna accessories, and spread spectrum technologies. The students will also learn WLAN infrastructure devices, WLAN organizations and standards, WLAN network architectures, wireless site survey and WLAN troubleshooting techniques.

Prerequisites: INFO 2311 plus 6 credits from courses in INFO at the 2000 level

INFO 3210 3 Credits
Distributed Systems

Students will learn principles, techniques and strategies used in design and implementation of distributed applications and system solutions that are robust, scalable, and secure. Students focus on modeling distributed systems and building distributed objects using .NET framework. Students will be required to develop a distributed business solution using C# and .NET Remoting.

Prerequisites: Acceptance into 3rd year of the BTech program.

INFO 3225 3 Credits
Web Multimedia

Students will learn the different types of multimedia (e.g. text, images, sound, animation and video) required in website development. They will learn the theoretical foundations and the practical tools for creating graphics, sound, animation and video content that will be used in websites, as well as multimedia design considerations.

Prerequisites: All of (a) 9 credits of courses in INFO at the 2000 level, (b) INFO 1213 and (c) INFO 2313 or CPSC 1204

INFO 3230 3 Credits
Advanced Object-Oriented Application Development

Students will learn to use object-oriented methodology to analyze, design and implement real-world software applications. Students will learn the best practices for iterative software development recommended by the Unified Process (UP). Student will learn the advanced features of the Unified Modeling Language (UML) in modeling distributed software applications. Students also will learn the concepts of software design patterns and how these patterns can be used to create flexible and extensible software.

INFO 3235 3 Credits
Software Quality Assurance

Students will learn the essential features involved in developing timely, cost-effective and high-quality software products that meet the user's requirements. They will examine the effective deployment of quality assurance procedures throughout the entire software development process. They will learn the concepts of Total Quality Management (TQM), the development of quality assurance plans, the implementation of verification and validation functions, the selection of tools to support quality assurance, the application of software metrics to measure quality, and the International Standards Organization (ISO) certification process.

Prerequisites: INFO 3150

INFO 3240 3 Credits
Enterprise Resource Planning Systems

Students will learn the concepts in Enterprise Resource Planning (ERP). They will learn the basis of how integrated information systems such as ERP systems can help companies to optimize business processes. Students also will learn business process modeling, process improvement and ERP implementation. They will explore the role of ERP in electronic commerce. Students will gain hands-on experience through working on an ERP system.

Prerequisites: 9 credits from courses in INFO at the 2000 level

INFO 3241 3 Credits
Identity Management

Students will learn the fundamental concepts of digital identity management. They will learn the concepts of digital identity, digital identity lifecycles, digital rights management and identity management architecture building. They will also examine industrial software and tools and use them to build identity management systems.

Prerequisites: INFO 3160

INFO 3245 **3 Credits**
Mobile Programming
Students will learn the skills for developing Android-based mobile applications. They will be introduced to the basics of wireless technologies associated with a smartphone such as cellular networks, Wi-Fi networks, satellite networks, and GPS systems. They will learn the Android fundamentals and the methods for designing and developing Android software programs for database, audio, video and communication applications.

Prerequisites: All of (a) 9 credits from courses in INFO at the 2000 level and (b) INFO 2313 or CPSC 1204

INFO 3246 **3 Credits**
Mobile Programming II
Students will learn software application development for iOS, the mobile operating system from Apple Inc. They will be introduced to programming in Objective-C and will learn the skills in designing, developing and deploying different types of mobile applications for both iPad and iPhone.

INFO 3250 **3 Credits**
Content Management and Information Architecture
Students will learn the concepts of content management and information architecture. They will learn to apply the enterprise content management (ECM) methodology for managing digital assets, records, and knowledge throughout an organization. They will learn how to analyze and plan ECM solutions based on an organization's needs and business requirements. Students will also learn to design information architecture and implement taxonomy in organizing content throughout the information life cycle.

Prerequisites: 9 credits from courses in INFO at the 2000 level

INFO 3280 (formerly INFO 4230) **3 Credits**
Information Technology Project Management
Students will learn topics in Information Technology (IT) project management. They will examine various issues related to the development and implementation of complex information systems. Students will explore the use of new technologies in IT project management and will use a project management software tool to complete assignments, case studies and a term project.

Prerequisites: 9 credits from courses in INFO at the 2000 level

INFO 3290 **3 Credits**
Virtualization
Students will learn the fundamentals of virtualization. They will learn the internals of a Virtual Machine (VM), how to install and deploy VM Applications on desktop computers and enterprise servers, back up and recovering VMs, use virtual file systems, implement failover clusters, create load-balanced clusters, build VM clusters. They will also be introduced to storage networking and storage virtualization, and virtualized information systems.

INFO 3390 **3 Credits**
Networking Technologies III
Student will learn the architecture, components, and operations of routers and switches in a larger and complex network. They will configure and troubleshoot routers and switches and resolve common issues related to routing and switching in both Internet Protocol version 4 (IPv4) and Internet Protocol version 6 (IPv6) networks.

Prerequisites: 9 credits from courses in INFO at the 2000 level, including INFO 2311

INFO 4105 **3 Credits**
Search Engine Principles
Students will learn the principles of search engines and information retrieval. Information filtering and retrieval drives some of the world's most successful and high-tech businesses. Students will learn various methods of search engine optimization (SEO), ranging from theory to implementation. Students will learn how to use tools and methods to perform searches and utilize results effectively. They will also learn how large data sources such as social media affects information retrieval.

Prerequisites: INFO 3135, plus 9 credits from courses in INFO at the 3000 level.

INFO 4110 **3 Credits**
Cloud Computing
Students will learn cloud computing basics, benefits and limitations, cloud computing technologies (hardware and infrastructure), cloud accessing technologies, cloud storage, standards in cloud computing, software as a service, platform as service and cloud application development.

Prerequisites: INFO 3390, plus 12 credits from courses at the 3000 level.

INFO 4115 **3 Credits**
Human Factors and Website Design
Students will learn computer interface design requirements based on perceptual and cognitive factors; learnability; recall, recognition and retention; speed and accuracy of performance, and apply them in Web design process. They will learn website planning and design, usability, website navigation design, graphics and color selection, text formatting using cascaded style sheet (CSS), browser compatibility testing and interactivity design using JavaScripts.

Prerequisites: INFO 3135 plus 9 credits from courses in INFO at the 3000 level

INFO 4120 **3 Credits**
Digital Forensics
Students will learn the foundations of digital forensics. They will learn the key technical concepts, the methodologies used and the tools needed in digital forensics. Students will learn how to perform examinations for computers, networks, mobile devices, GPS, the Cloud and the Internet. Students will also learn how to collect evidence, document the scenes, and recover deleted data.

Prerequisites: INFO 3170 plus 9 credits from courses in INFO at the 3000 level

INFO 4125 **3 Credits**
Website and Cloud Security
Students will learn the core mechanisms and tools for Web and cloud security. They will learn the principles of Web attacks on authentication, users, application servers, data stores, back-end components, application logic and bypassing client side controls. They will learn how to discover and prevent Web security flaws during Web application development and measures to improve Web security. They will also learn how to identify and resolve the security issues specific to public and private clouds.

Prerequisites: INFO 2411 plus 12 credits from courses in INFO at the 3000 level

INFO 4190 **3 Credits**
Integration Project I

Students will conduct an extensive literature review and research for projects originating from faculty or the stakeholders from the industry or local communities. Students will carry out detailed project designs and complete the overall project design documentation in this capstone course. They will report the design results through presentations that are open to all faculty and students in the department and industry sponsors. Students will apply in great depth and breadth the system, hardware, software and project management knowledge they learned in the program to the accomplish the tasks of the project.

Note: This course is a prerequisite for INFO 4290 Integration Project II where the students will implement their designs using software and/or hardware.

Prerequisites: 24 credits from courses in INFO at the 3000 level

INFO 4210 (formerly INFO 4210/PSYC 4920) **3 Credits**

Human Factors and Computer Interface Design

Students will study procedures for analyzing human-computer interaction (HCI) and will translate this information into design criteria. They will learn to ensure that computer interface design specifications meet end-user requirements for perceptual and cognitive factors; learnability; recall, recognition and retention; speed and accuracy of performance; cultural factors; and job satisfaction. They will identify task and system requirements and perform usability testing methodologies for both desktop and small screen interfaces.

Prerequisites: 12 credits from courses in INFO at the 3000 level, and acceptance into 3rd year of the BTech program.

INFO 4225 **3 Credits**
Animations

Students will learn the skills of using professional software to create animations for Web applications. They will learn simple and complex graphics, graphics on multiple layers, symbols and basic animation, motion and shape Tweening, buttons and actions, and action programming.

Prerequisites: INFO 3225

INFO 4235 **3 Credits**
Special Topics in Web and Mobile Application Development

This course offers selected topics on web and mobile application development. The topics will be based on emerging industrial technologies, including but not limited to application design, service integration, system development, and application deployment on both web and mobile platforms. Students will learn novel concepts of web and mobile technologies required by the IT industry.

Prerequisites: INFO 3135, plus 9 credits from courses in INFO at the 3000 level

INFO 4250 **3 Credits**
Special Topics in Network Administration and Security

Students will learn special topics in network administration and security. This course is designed to cover emerging technologies that the department deems important but are not covered in other courses. Currently the course covers data center fundamentals. Topics include introduction to server farms, infrastructure protocols, security and load balancing, server health management, persistence mechanisms on load balancers and data center design.

Prerequisites: INFO 3160

INFO 4260 **3 Credits**
Networking Technologies IV

Students will learn Wide Area Network (WAN) technologies and network services in a complex network. They will analyse and evaluate network devices and WAN technologies to meet network requirements. Students will also develop the knowledge and skills needed to implement Internet Protocol Security (IPSec) and Virtual Private Network (VPN) operations in large network.

Prerequisites: 12 credits from courses in INFO at the 3000 level, including INFO 3390.

INFO 4290 **3 Credits**
Integration Project II

Students will implement the project designs they produced in the course INFO 4190 (Integration Project I) using suitable software tools and selected hardware. They will test and debug the project implementations and generate the final system prototype and project documentation. They will report and demonstrate the final project results through presentations which are open to all faculty and students in the department, as well as industrial sponsors.

Prerequisites: INFO 4190

INFO 4310 **3 Credits**
Entrepreneurial Development in Information Technology

Students will gain an understanding of entrepreneurship fundamentals in the information technology sector, including business planning, financing and venture capital, operations, human resources, marketing and personal selling.

Prerequisites: 12 credits of courses in INFO at the 3000 level

INFO 4320 **3 Credits**
Software Quality Assurance

Students will learn the essential features involved developing timely, cost-effective and high quality software products that meet the user's requirements. They will examine the effective deployment of quality assurance procedures throughout the entire software development process. Other topics covered in this course will include: the concepts of Total Quality Management (TQM), development of quality assurance plans, implementation of verification and validation functions, selection of tools to support quality assurance, application of software metrics to measure quality, and the International Standards Organization (ISO) certification process.

INFO 4330 **3 Credits**

Data Warehousing and Data Mining

Students will examine the problems caused by having too much information and the methods, processes and tools for extracting useful information from multidimensional databases and data marts stored on different system platforms. They will also acquire the techniques for defining, selecting, implementing and evaluating data warehousing and data mining solutions for businesses.

Prerequisites: INFO 2312, plus 12 credits from courses in INFO at the 3000 level.

INFO 4350 **3 Credits**

Wireless Technologies and Programming

Students will learn the concepts and principles of wireless technologies, wireless devices, wireless signals, wireless networks and wireless access technologies. They will learn wireless programming techniques and will develop wireless applications using technologies that include Wireless Markup Language (WML), WMLScript, Java and Microsoft .NET based wireless application development environments.

INFO 4370 **3 Credits**

Security of Wireless Systems

Students will learn about wireless security technologies such as advanced user authentication, robust encryption, and intrusion prevention. They also will learn concepts of wireless discovery, wireless attack identification and monitoring, and wireless security policies and solutions. Students will be required to conduct research and work on a project to solve real-world wireless system security problems in a simulated environment.

Prerequisites: INFO 3180, plus 9 credits from courses in INFO at the 3000 level.

INFO 4381 (formerly INFO 4380) **3 Credits**

Internet of Things and Applications

Students will learn the concepts of "Internet of Things" (IoT) and their related applications. The underlying principles and architectures of sensors and actuators are discussed. The course also examines IoT's connectivity, platforms and different application domains. Data analytics and IoT system security are also explored in the course. In addition, students will do a course project using selected hardware, software and development tools.

Prerequisites: INFO 3180 and 9 credits from courses in INFO at the 3000 level