COMPUTER SCIENCE COURSES (ICS, ITS, CS) <300													
(1/05)													
Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	100	Comp Lit & Appl This course is an introduction to information technology. Recommended Preparation: Keyboarding skills or OAT 20B, English 100 skills, Math 24 skills. WCC:SS	3	1									1	
ICS	100	Computing Lit & Apps An introductory survey of computers and their role in the modern world. Emphasis is on computer terminology and hardware and software. Opportunities for "hands-on" experience using microcomputer applications software may include spreadsheets, word processing, graphics and database management systems (45 lecture hours). [NS3] *Prerequisite: ENG 21 or English 22 and MATH 24 with a grade of C or b etter or equivalent or consent of instructor.*	3	1						1				
ICS	100	Computing Literacy & Applns *PreReq: ESL 9 or Eng 20R or Eng 51 or placement in Eng 21; and Math 50 or Math 24X or placement in Math 26* An introduction to computer science including computer history, concepts, and technological developments. Hands-on use of a current PC operating system, business uses of word processing and spreadsheet programs, and a very brief introduction to computer programming and hardware operation. (3 lec hrs., 2 lec/lab hrs.)	4	1	1								
ICS	100	Computing Literacy & Appls *Recommended Prep: ENG 22 or 60 OR placement in ENG 100* This course is a computer literacy course. It provides those basic concepts and skills related to computers and computing that are needed in today's information age. The students will acquire an understanding of concepts in word processing, spreadsheet management, database management, elementary computer graphics, desk top publishing, electronic mail and telecommuni-cations. They will also learn some of the history of computers and an awareness of the process of creating a computer program. (Credit may be received for only ICS 100, 100E, 100M or 100T) May be taken on a CR/N basis. (3 hrs. lect. Per week plus lab assignments)	3	1			1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	100	Computing Literacy and App *Credits:* 3 *Class hours:* 3 lecture *Comments:* Credit by exam is not an available option. *Description:* This non-technical introduction to computers and their uses in today's society provides students with an understanding of basic computer concepts, terminology, and current events. Students are involved in "hands-on" experience with word processing, spreadsheets, database software, electronic-mail, and telecommunications.	3	1					1					
ICS	100	Computing Literacy and Apps *3 hours lecture per week* *Prerequisite(s): Credit or concurrent enrollment in ENG 22 or* *qualification for ENG 100 or higher level English; qualification* *for MATH 24 or higher level mathematics.* *Recommended Preparation: Keyboarding experience* ICS 100 is a nontechnical introduction to computers and their uses in society, in business, and in the home environment. ICS 100 provides the knowledge essential to a computer literate functioning member of society. Students will increase their understanding of the history of computers, basic information processing cycle, access and dissemination of information via the World Wide Web, and how computer technology affects the world in which we live. The course includes hands-on experience with computer and Internet applications such as word processing, spreadsheet, and e-mail. In addition, computer operating systems (OS) such as Windows 95/98/NT/ME/2000/XP will be covered to provide the student with the navigational skills required to be functional on the computer.	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	100	Computing Literacy/Appl Introduces basic computer concepts and computer terminology. Includes handson experience with word processing, spreadsheets, data base, Internet, presentation and operating system software. An introduction to HTML coding of web pages is also included. Satisfies the community college computer literacy requirement. 3cr., 3hr. lect./disc.	3	1								1		
ICS	100B	Intro to Windows and the Web *1 lecture hour per week* *Prerequisite(s): Qualification for ENG 22 or higher level English* *or concurrent enrollment in ENG 21 or consent of instructor.* *Comment: Completion of ICS 100B, ICS 100C, and ICS 100D* *may fulfill the Natural Science requirement for an A.S. degree.* ICS 100B is a non-technical introduction to computers and the Internet. Students will increase their understanding of the dissemination of information via the World Wide Web and use of the Windows operating system to manage their computer files. The course includes hands-on experience with computer and Internet applications such as Web browsers, e-mail, and file transfer protocol. In addition, computer operating systems (OS) such as Windows 98/ME/2000/XP will be covered to provide the student with the navigational skills required to be functional on the computer.	1	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	100BC	IntroWindowsWebWord&Powerpoint *2 hours lecture per week* *Prerequisite(s): Qualification for ENG 22 or higher level English,* *or concurrent enrollment in ENG 21, or consent of instructor.* *Comment: Completion of ICS 100BC, and ICS 100D may fulfill* *the Natural Science requirement for an A.S. degree.* ICS 100BC is a non-technical introduction to computers, the Internet, word processing and presentation software. Students will increase their understanding of the dissemination of information via the World Wide Web and use of the Windows operating system to manage their computer files. Students will gain proficiency in the use of common word processing and presentation software. The course includes hands-on experience with computer and Internet applications such as word proc essors, presentation software, Web browsers, e-mail, and file transfer protocol. In addition, computer operating systems (OS) such as Windows 98/ME/2000/XP will be covered to provide the student with the navigational skills required to be functional on the computer.	2	1				1						
ICS	100C	Intro to Word and PowerPoint *1 hour lecture per week* *Prerequisite(s): Qualification for ENG 22 or higher or concurrent* *enrollment in ENG 21, or consent of instructor.* *Comment: Completion of ICS 100B, ICS 100C, and ICS100Dmay fulfill the Natural Science requirement for an A.S.degree.* ICS 100C is a non-technical introduction to word processing and presentation software. Students will gain proficiency in the use of common word processing and presentation software.	1	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	100D	Intro to Microsoft Excel *1 hour lecture per week* *Prerequisite(s): Qualification for MATH 25 or higher level mathematics or concurrent enrollment in MATH 24;* *qualification for ENG 21 or higher level English; or consent of instructor.* *Comment: Completion of (a) ICS 100B, ICS 100C, and ICS 100D, or (b) ICS 100BC and ICS 100D may fulfill the Natural Science requirement for an A.S. degree.* ICS 100D is a non-technical introduction to spreadsheets and Microsoft Excel. Students will gain proficiency in the use of common spreadsheet software.	1	1				1						
ICS	100E	Comp Lit & Applications (CENT) *Recommended Prep: ENG 22 or 60 OR placement in ENG 100* *CENT and EIMT majors only.* This course is a computer literacy course. It provides those basic concepts and skills related to computers and computing that are needed in today's information age, and, in particular, in the general area of computing and electronics. The students will acquire an understanding of concepts in word processing and basic skills in other applications appropriate to the computing and electronics industry. (Credit may be received for only ICS 100, 100E, 100M or 100T) May be taken on a CR/N basis. (3 hrs. lect. Per week plus lab assignments)	3	1			1							
ICS	100M	Comp Lit & Applications (Mfg) *Recommended Prep: ENG 22 or 60 OR placement in ENG 100* *CA, AEC, and FT majors only.* This course is a computer literacy course. It provides those basic concepts and skills related to computers and computing that are needed in today's information age, and, in particular, in the general area of manufacturing. The students will acquire an understanding of concepts in word processing and basic skills in other applications appropriate to the manufacturing industry. Credit may be received for only ICS 100, 100E, 100M or 100T. May be taken on a CR/N basis. (3 hrs. lect. Per week plus lab assignments)	3	1			1							

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	100T	Comp Lit & Appls (Trans) *Recommended Prep: ENG 22 or 60 OR placement in ENG 100* *AMT, ABRP, AERO, DISL, and MARR majors only.* This course is a computer literacy course. It provides those basic concepts and skills related to computers and computing that are needed in today's information age, and, in particular, in the general area of transportation. The students will acquire an understanding of concepts in word processing and basic skills in other applications appropriate to the transportation industry. (Credit may be received for only ICS 100, 100E, 100M or 100T.) May be taken on a CR/N basis. (3 hrs. lect. Per week plus lab assignments)	3	1			1							
ICS	101	Micro Computer Applcns PreReq: Eng 21 or placement in Eng 22 or placement in ESL 15; and Math 25X or Math 26 or placement in Math 100 Tools for the information age. Use of software packages for business problem-solving—a microcomputer operating system, word processing, spreadsheet, graphics, database management system, and presentations programs. Hands-on experience is provided on the computer, out of class exercises required. (3 lec hrs., 2 lec/lab hrs.)	4	1	1									
ICS	101	Tools for Info Age This course examines the utilization of major application packages as tools in business problem solving. *Fulfills the computer-competency course requirement for the UH Manoa College of Business Administration* (45 lecture hours). *(Formerly ICS 115)* *Prerequisite: ENG 21 with a grade of C or better or equivalent and Math 1B with a grade of C or better or equivalent.* *Recommended Preparation: ICS 100.*	3	1						1				
ICS	101	Tools for Information Age Fundamental concepts and terms of computer technology, application software for problem solving, computer technology trends and impact on individuals and society. (3 hrs. lect. per week) *Prerequisite: ENG 22 or 60 OR placement in ENG 100*	3	1			1							

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ICS	101	Tools for Informatn Age *Description:* This course presents fundamental concepts and terms of computer technology, basic hardware components, systems software, application software, computer technology trends, and impact of computers on individuals and society. Application software is used for problem solving. The laboratory is part of the class. *Prereq:* "C" or higher in ENG 22 and MATH 25, or "C" or higher in ICS 100, or acceptable writing and math placement test scores. *Comments:* The laboratory is part of the class. Credit by exam is not an available option.	4	1					1					
ICS	101	Tools for the Information Age Fundamental concepts and terms of computer technology, application software for problem solving, computer technology trends and impact on individuals and society.	4	1							1			
ICS	101	Tools Info Age This course examines the major application programs and encourages students to incorporate technology in their work and lives. Prerequisite: ENG 100; MATH 25 or 1 yr. high school algebra. Keyboarding, basic typing skills.	3	1									1	
ICS	101A	Tools for the Information Age Not in catalog	4	1							1			
ICS	102	Internet Resources Introduces the variety of resources available on the Internet. Examines history, current issues, and how the Internet works. Teaches terminology, file formats, and addressing. Introduces the concept of client-server programs as applied to the Internet. Explores use of the World Wide Web as a vehicle for research. Teaches how to find, evaluate, and publish information. *Prereq: ICS 100 or BCIS 161, or consent.* *Recommended: Familiarity with the Internet.*	3	1								1		

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	102	Intro to Internet Resources *Some sections may be for CENT majors only.* This course introduces the many resources available on the Internet. Topics will include history, current issues and how the Internet works. Terminology, .le formats, and naming conventions will be covered. Students will be introduced to the concept of client-server programs as they apply to the Internet. Special emphasis will be placed on the World Wide Web, where students will learn to browse and publish information. Cross-listed as CENT 102. Credit may be received for only ICS 102 or for CENT 102 but not for both. (3 hrs. lect. per week) *Prerequisite: Any one of the fo llowing: ICS 100, 100E, 100M, 100T, 101*	3	1			1							
ICS	102	The Internet This course introduces the Internet and its effects on modern society. Students will review its history, concepts, and terminology; and learn how to connect to and navigate the Internet. Emphasis will be on using the Internet to access and provide information on a worldwide network. The course covers the basic concepts of networking, protocols, security and communication terminology pertaining to the Internet. A variety of Internet resources will be demonstrated and subsequently explored by students. *Prerequisite: ENG 21 or ENG 22 and MATH 24 or equivalent and ICS 100 all with a grade of C or better, or consent of Instructor.*	3	1						1				
ICS	102	The Internet This course shows students how to productively use the Internet for college, business, and home use. Students will review the history and terminology of the Internet. Internet infrastructure and connectivity will be covered. The multimedia interface of the Internet and the World Wide Web (WWW) will be used extensively in a hands -on environment. The course includes Internet uses such as communication, electronic commerce, information gathering, entertainment, and education. Webpage design will be introduced. (3 hrs. lect.) Recommended Preparation: Basic computing skills.	3	1									1	

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	102	The Internet *3 hours lecture per week* *Prerequisite(s): ITS 101, ITS 102 or ICS 101;* *qualification for* *ENG 100; qualification for MATH 25* *Recommended Preparation: Keyboarding* *Experience* ICS 102 introduces the Internet and its effects on modern society. Students will review its history, concepts, and terminology; and learn how to connect to and navigate the Internet. Emphasis will be on using the Internet to access and provide information on a worldwide network. A variety of Internet resources will be demonstrated and subsequently explored by students.	3	1				1						
ICS	104	Intro Net/Comp Sup This course will provide the student with the basic concepts of data communications, networking and connectivity. It contains an overview of the types of local and wide area networks and is intended to introduce students to the vocabulary used in the field, expand students' technical expertise, and remove students' fear of networking. The course includes hands -on training in network computer support, including installation of network devices, software, cabling and connections. (3 hrs. lect.) Prerequisite: ICS 101 (may be conc urrent) or consent of instructor.	3	1									1	
ICS	105B	Retrieval CRS-OP Sys This one-credit course is an introduction to operating skills literacy and is designed to help students master prerequisite skills for IRT intensive courses. The course will help students master the National Education Technology Standards (NETS) which are aligned with the University of Hawaiʻi General Education Requirements. NETS standards are (1) Basic operations and concepts, (2) Social, ethical, and human issues, (3) Technology productivity tools, (4) Technology communications tools, (5) Technology research tools, and (6) Technology problem-solving and decision-making tools.	1	1									1	

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ICS	105C	Retrieval Crs-WP Skills This web-enhanced* course is designed to prepare students for the Computer and Information Literacy Exam. Students in this course will learn to: • Create, edit, format, and print word rocessing documents • Save a new document • Save an existing document to a new name or location • Create folders and manage files • Find documents using the "search" feature • Format text, paragraphs, and documents • Create tables • Insert graphics This is a CIL preparatory course; passing this course does not guarantee passing the CIL exam. *WebCT is used as a course management tool. (1 hr. lect.) Recommended: Keyboarding skills.	1	1									1	
ICS	105D	RETRIVL CRS-OL COMM SK The one-credit course is an introduction to on line communication skills literacy and is designed to help students master prerequisite skills for IRT intensive courses. The course will help students master the National Education Technology Standards (NETS) which are aligned with the University of Hawaiʻi General Education Requirements. NETS standards are (1) Basic operations and concepts, (2) Social, ethical, and human issues, (3) Technology productivity tools, (4) Technology communications tools, (5) Technology research tools, and (6) Technology problem-solving and decision-making tools.	1	1									1	

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ICS	105E	Ret Crs-Elec Ret Info This web-enhanced* course is designed to prepare students for the Computer and Information Literacy Exam. Students in this course will learn to: • Recognize when information is needed • Locate, evaluate and use the needed information effectively and ethically • Create a web portfolio as a final project This is a CIL preparatory course; passing this course does not guarantee passing the CIL exam. Students who have received credit for or are currently enrolled in ICS 102 may not receive credit for ICS 105E to use toward the AA degree. *WebCT is used as a course management tool. (1 hr. lect.) Recommended: Basic keyboarding; familiarity with word processing.	1	1									1	
ICS	105F	Voice Input Students who take this web-enhanced* course will learn Dragon NaturallySpeaking software. By the end of the course, students will use voice commands to: • Dictate words into the computer • Use commands and techniques • Format and edit simple documents • Navigate software *WebCT is used as a course management tool. (1 hr. lect.) Recommended Preparation: ENG 22.	1	1									1	
ICS	105G	Microsoft PowerPoint • Creating, editing, viewing, and saving slide presentations • Using wizards and templates • Adding transitions and effects • Choosing appropriate clipart and graphics • Editing clipart • Printing handouts *WebCT is used as a course management tool. (1 hr. lect.) Recommended Preparation: ENG 21 and 22.	1	1									1	

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	105H	**Microsoft Word** Students in this web-enhanced* course will learn Microsoft Word. Competencies included in the Microsoft Office User Specialist (MOUS) Word exam** at the Core level are covered: • Working with text, paragraphs, and long documents • Adding page numbering, headers, and footers • Using the Office Assistant and Wizards • Saving a document as a web page and creating hyperlinks • Creating, formatting, and modifying tables • Enhancing documents with graphics, borders and shading • Using Mail merge *This course uses WebCT as a course management tool. **An additional fee will be required for the MOUS exam. MOUS exam is optional. (3 hrs. lect.) Recommended Preparation: ENG 21 and ability to type or key to touch.	3	1									1	
ICS	106	**Database Fundamentals** This is an introduction to the concepts and theory of a database. The course covers file organization, information handling, management, and control via a database management system. A substantial part of the course involves the development of an understanding of data processing blocks: fields, records and files. Structured programming techniques are emphasized. Report generation techniques are also covered. The course includes hands-on use of microcomputers to provide the students with experience creating, implementing, loading and using a database. * (45 lecture hours) *(Formerly ICS 113)* *Prerequisite: ENG 21 or ENG 22 and MATH 25 or equivalent and ICS 100, all with a grade of C or better, or consent of instructor*	3	1						1				

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ICS	107	The Internet with Web Site Dev This course presents concepts for creating web sites from design through publishing. Hands-on activities will include working with graphics and other multimedia elements, and developing professional web sites. Web pages will be designed for marketing, providing news, showing information, and sharing opinions. A variety of Internet resources will be emonstrated and subsequently explored by students. Design, usability, accessibility, web markup language, and integrating other elements will be emphasized. (3 hrs. lect.) Recommended Preparation: Basic computing skills.	3	1									1	
ICS	110	Intro Cmptr Programg Not in catalog	3	1								1		
ICS	110	Introduction to Programming A practical introduction to the theory of stored program digital computers. Students are taught flowcharting, documentation techniques and the use of a programming language to solve various scientific and business-oriented problems. The emphasis is on basic concepts and functional characteristics in the design and development of computer programs. *(Formerly ICS 130)* *Prerequisite: ENG 21 and MATH 25 with a C or better or equivalent.* *Rec Preparation: ICS 100.*	3	1						1				
ICS	111	Intro Comp Sci I This is an introductory course in computer programming. Emphasis is on structured programming, problem solving, algorithm development, computer language coding, implementation, and debugging/testing (45 lecture hours. [NS3] *Prerequisite: ENG 21 or 22 and Math 103 or equivalent, all with a grade of C or better or consent of instructor.*	3	1						1				

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	111	Intro Comp Sci I This is an introductory course for students intending to major in computer science and requiring a computer programming course. Emphasis will be on problem solving, algorithm/pseudocode development, structured programming, computer language coding, implementation and debugging/testing. Students will develop application programs in an IBM microcomputer/DOS/Windows operating system environment. Students will be taught to develop appropriate programs using accepted standards and methodologies. Actual programming is a part of this course. (3 hrs. lect./1 hr. lab.) Prerequisite: MATH 27 or MATH 103, or equivalent; or consent of instructor.	4	1									1	
ICS	111	Intro Computer Sci *Credits:* 4 *Class hours:* 3 lecture and 3 lab *Prereq:* "C" or higher in ICS 101 *Comments:* The laboratory is part of the class. Credit by exam is not an available option. *Description:* This is an introductory course in computer programming. Emphasis is on structured programming, problem solving, algorithm development, computer language coding, implementation, and testing/debugging. The programs are implemented in a structured language. The course meets the Association for Computing Machinery-Computer Science (ACM-CS I) course standards.	4	1					1					
ICS	111	Intro Computer Sci I *Prereq: ICS 100, placement at MATH 27 or 107, placement at ENG 22 or 100, or consent.* Introduces students to problem solving using computers. Designed for students entering computer science, engineering, or other fields that require a background in computer programming. Teaches the basics of the computer hardware/software interfaces. Includes programs, applications, and compliers. Programming concepts, algorithms, and problem solving techniques are introduced using high-level objectoriented programming languages. *Meets ACM CS 1 course standards.* 4cr., 4hr. lect./lab	4						1			1		

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ICS	111	Intro to Computer Science I *3 hours lecture per week* *Prerequisite(s): Qualification for ENG 100 or ESL 100;* *qualification for MATH 135; ICS 101 or consent of instructor* ICS 111 is an introductory course in computer programming utilizing the Java programming language. This course is designed for Computer Science majors and all others interested in a first course in programming. The goal of ICS 111 is to introduce the basic concepts of computer programming, such as algorithms, software design, object orientation, debugging, and testing. Algorithm development and structured programming techniques are emphasized. Basic constructs common to modern programming languages, such as constants, variables, conditionals, iteration, arrays, objects, methods, classes, and packages are covered.	3	1				1						
ICS	111	Intro to Computer Science I Overview of computer science, writing programs. Pre: 101 or equivalent. Recommended: computer experience.	4	1							1			
ICS	111	Intro to Computer Science I *Prerequisite: MATH 27 or 58 or 103 OR placement in MATH 135 or hi gher* This is an introductory course in computer programming. The emphasis is on a disciplined approach to writing computer programs. The understanding, reading, and writing of algorithms is a major portion of the course. An Object Oriented approach is used. An Object Oriented language, such as Java or C++, is used. The students will be expected to develop a number of increasingly complex programs during the course. (4 hrs. lect. per week)	4	1			1							
ICS	111A	Intro to Computer Science I Not in catalog	4	1							1			

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	113	Database Fund This is an introduction to the concepts and theory of a database. The course covers file organization, information handling, management, and control via a database management system. A substantial part of the course involves the development of an understanding of data processing blocks: fields, records and files. Structured programming techniques are emphasized. Report generation techniques are also covered. The course includes hands -on use of microcomputers to provide the students with experience creating, implementing, loading and use a database (45 lectures hours). *Prerequisites: ENG 21 or ENG 22 and MATH 25 or equivalent and ICS 100, all with a grade of C or better, or consent of instructor.*	3	1						1				
ICS	113	Database Fund This course examines file organization and the use of computer databases. It also examines the handling of information through its organization, management and control. A substantial part of the course develops an understanding of the data processing building blocks: files, records and fields. Techniques to report and maintain data are also covered. (Offered spring semester only.) (3 hrs. lect.) Prerequisite: ICS 100 or 101; placement into ENG 100 and MATH 24 and completion of OAT 20B or OAT 21B; or equivalent.	4	1									1	
ICS	113	Database Fundamentals *Prerequisite: ENG 22 or 60 OR placement in ENG 100* This course examines file organization and the use of computer databases. A substantial part of the course develops an understanding of the data processing building blocks: files, records and fields. Techniques to report and maintain data are also covered. (3 hrs. lect. per week)	3	1			1							

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	115	Microcomputer Applicatn *Prereq: BCIS 161 or ICS 100, or consent. Recommended: MATH 25 and elementary word processing or typewriting skills.* Examines the utilization of major application packages as tools in business problem solving. Covers the following applications: a micro-computer operating system, word processing, spreadsheets, graphics, and database management systems. 3cr., 3hr. lect./lab	3	1								1		
ICS	116	Cross-Media Publish Prt & Web Not in catalog	3	1								1		
ICS	120	Spreadsht Fund Students who complete this course will be able to accomplish the following: • Simulate "what if" scenarios • Create spreadsheet templates • Design worksheets to solve complex tasks • Develop spreadsheet workbooks composed of several related worksheets • Minimize redundant data by linking information among worksheets • Utilize complex spreadsheet functions to solve problems • Utilize spreadsheet tools to analyze data • Create macros to complete repetitive tasks • Integrate spreadsheet data with a word processor • Publish spreadsheet data to the World Wide Web or a corporate Intranet. (3 hrs. lect.) Prerequisite: ICS 100 or 101 and OAT 20B; placement into ENG 100 and MATH 25.	3	1									1	
ICS	120V	Projects Comp Sci and Prgrm **Credits:** 1-2 **Class hours:** 3-6 lab **Prereq:** "C" or higher in ICS 101 **Comments:** Credit by exam is not an available option. May be repeated once for credit. **Description:** This course is primarily for students with a strong interest in computers and computer programming. The class involves materials and techniques beyond those used in the regular computer science courses. Students work individually problem solving by computer.	1	1					1					
ICS	121C	Microcomp Topics Not in catalog	4	1									1	

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ICS	121V	Microcomputer Topics This course covers current microcomputer topics. The course is designed to have variable credits to coincide with the rigor of the topic. A student may enroll and receive credit for this course more than one time (for different topics). A course description will be on record to designate the various topics for a student's transcript. (1-4 lect. hrs.) Prerequisite: ICS 100 or ICS 101 or consent of instructor. Prerequisite for specific courses will be announced. (See department chair or instructor.)	1	1									1	
ICS	125	Comp Main/Repair This course is an introduction to the hardware components of microcomputer systems. The specification, selection, installation, and configuration of hardware components including memory, floppy disk drives, hard disks, monitors, and printers are covered. Advantages and disadvantages of hardware components, and compatibility requirements are identified. Opportunities for "hands-on" activities will include the installation and configuration of hardware components. (3 hrs. lect.) Prerequisite: ENG 22 and placement into MATH 24.	3	1									1	
ICS	125	Microcomputer Maintenance Not in catalog	3	2			1							
ICS	125	Microcomputer Maintenance Introduction to the hardware components of microcomputer systems. The specification, selection, installation, and configuration of hardware components including memory, floppy disk drives, hard disks, monitors, and printers are covered. Advantages and disadvantages of hardware components, and compatibility requirements are identified. Opportunities for hands-on activities may include the installation and configuration of hardware components and database management systems . *Prerequisite: ENG 21 or ENG 22 and MATH 25 or equivalent and ICS 130, all with a grade of C or better, or consent of Instructor.* *Recommended Preparation: ICS 100 or ICS 101.*								1				

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ICS	130	Elementary Basic Not in catalog	3	2			1					1		
ICS	130	Intro to Prgm Practical introduction to the theory of stored program digital computers. Students are taught flow -charting, documentation techniques and the use of a programming language to solve various scientific and business-oriented problems. The emphasis is on basic concepts and functional characteristics of a digital computer [NS3] *Prerequisite: ENG 21 and Math 25 with a C or better or equivalent.* *Recommended Preaparation: ICS 100*	3	1						1				
ICS	135	Visual Basic Introduction to window -based programming using Visual Basic. Topics covered include the Visual Basic environment, user-interface design, data types, scope, control structures, data structures, files and graphic s. (45 lecture hours) [NS3] Prerequisite: ICS 130.	3	1						1				
ICS	140	Elem Oper Systems This course examines and compares several operating systems used on computers. Comparisons of graphics user interface and command user interface operating systems will be made. Students will work with the Windows and Unix systems. Other systems will be researched. (3 hrs. lect.) Prerequisite: Placement into ENG 100 and MATH 24 and completion of OAT 20B or equivalent.	3	1									1	
ICS	141	Discrete Math Comp Sci I *Prerequisite: MATH 135* *Prerequisite or Corequisite: ICS 111* *Recommended Prep: MATH 205*Introduction to discrete mathematics: logic, sets, functions, number theory, matrices, mathematical reasoning, counting techniques, recurrence relations, relations, equivalences, partial orders, graph and tree concepts. (3 hrs. lect. per week)	3	1			1							

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	141	Discrete Math for Com Sci I Covers logic, sets, functions, algorithms, number theory, matrices, mathematical reasoning, counting techniques, and relations (including closures, equivalence relations and partial orders). Selected algorithms/programs will be observed and compared on the computer. * (45 lecture hours) *Prerequisite: MATH 100 or higher and ICS 111 (or concurrent), all with a grade of C or better.*	3	1						1				
ICS	141	Discrete Math for CS I Logic, sets, functions, matrices, algorithmic concepts, mathematical reasoning, recursion, counting techniques, probability theory. Pre: two years of high school algebra, one year of plane geometry, and precalculus assessment; or consent. **FS**	3	1							1			
ICS	151C	Intro C Programming *Prereq: ICS 111 with at least a C, or consent.* Introduces students to C Programming Language, and an Integrated Development Environment (IDE). Develops structured programs using problem solving, algorithm development, and programming concepts using a procedural language. 3cr., 3hr. lect./lab	3	1								1		
ICS	151C	Programming In C *Prerequisite: ICS 111* This is a course in the C programming language. Students will solve systems and scienti.c problems using C. The emphasis is on the C language syntax and good programming style. The students should already have taken a beginning programming course. (3 hrs. lect. per week)	3	1			1							
ICS	151J	Programming in Java Not in catalog	3	1								1		
ICS	151Z	Structured Database Prg Introduction to programming in a database programming language. Application requirements are explained through a presentation of a set of data structures, or logical schema, for sample applications. Structured programming style are emphasized. Students will develop complete menu-driven systems (45 lecture hours). [NS3] *Prerequisite: MATH 103 or equivalent, ICS 113 and ICS 135, all with a grade of C or better, or consent of instructor.*	3	1						1				

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	155	Methods in COBOL This course is designed to improve the student's problem solving ability and to introduce students to the COBOL language. Students will solve business-oriented problems assigned to them. At the completion of the course, students can expect to have developed the capability to use the COBOL language without difficulty in writing programs to process sequential disk files. * (45 lecture hours) *Prerequisite: MATH 27 or equivalent with a grade of "C" or better and ICS 130 or equivalent with a grade of "B" or better, or consent of Instructor*	3	1						1				
ICS	160	Elem Basic Not in catalog	4	1									1	
ICS	160L	Elem Basic Lab Not in catalog	1	1									1	
ICS	161	Computer Graphics *Prereq: ICS 100, or BCIS 161, or consent.* Introduces computer graphics tools and concepts in digital image editing, illustration graphics, print and web design, 2D and 3D animation. 3cr., 3hr. lect.	3	1								1		
ICS	163	Desktop Publishing Upon completion of this introductory desktop publishing course, the student will be able to do the following: • Demonstrate an understanding of the relationship between typography, text and space; • Describe the concepts of color theory; • Demonstrate the ability to operate a desktop publishing software program to layout business cards, fliers, ads, brochures, and multi-page documents; • Demonstrate the ability to operate a graphic program to edit clipart and photos; • Demonstrate the steps to scan a photo or line drawing; • Analyze and design a project for a target group; • Demonstrate the ability to create a file to take to a printer. (3 hrs. lect.) Recommended Preparation: Basic computing skills.	3	1									1	
ICS	167	Intro Comp Sci I Not in catalog	4	1									1	

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	184	Fundamentals of Networking Not in catalog	3	1			1							
ICS	184	Netprep Network Fund Introduces the student to the concepts of data communications, telecommunications, and networking .It provides a conceptual view of networking and will bring together the acronyms, protocols, and components used in today's networks. It is the fundamental portion for the Basic Certificate in Computer Networking, designed to specifically provide the student with a practical and comprehensive working knowledge of networking. *Prerequisite: ICS 100 and MATH 103 or concurrent or equivalent, or consent of Instructor.* *Recommended Preparation: ICS 125.*	3	1						1				
ICS	184	Networking/Data Commun Not in catalog	4	1								1		
ICS	184B	Network & Data Comm I Introduces students to networking theory and practice. Presents topics including, Communications concepts, local and wide area networks, distributed systems and local area network design, installation, and administration. Module I covers the physical layer of the OSI model as a foundation for understanding data communications and networking. (ICS 184B is the first part of three modules formerly offered as ICS 184.) *Prerequisite: ICS 130 and Math 103 or concurrent or consent of Instructor.*	1	1						1				
ICS	184C	Network & Data Comm II Introduces students to networking theory and practice. Presents topics including communications concepts, local and wide area network design, installation, and administration. Module II covers the data link layer, the transport layer, the network layer and the other upper layers, which are normally combined in most protocols of the OSI model. TCP/IP is emphasized. (ICS 184C is the second part of three modules formerly offered as ICS 164.) *Prerequisite: ICS 130 and Math 103 or concurrent or consent of Instructor.*	1	1						1				

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	184D	Network & Data Comm III Introduces students to networking theory and practice Presents topics including communications concepts, local and wide area network design, installation, and administration. Module III covers current networking software, installation and administration. (ICS 184D is the third part of three modules formerly offered as ICS 184.) *Prerequisite: ICS 130 and Math 103 or concurrent or consent of Instructor.* *Recommended Preparation: ICS 184B and ICS 184C.*	1	1						1				
ICS	185	Netprep Local Area Net This course is designed to bring the student up to date on the latest concepts of Local Area Network (LAN) technologies. It provides a comprehensive introduction to the concepts, technologies, components and acronyms inherent in today's local networking environments. *Prerequisite: ICS 184 or consent of instuctor.*	3	1						1				
ICS	186	Netprep Wide Area Net This course is designed to provide the student with conceptual and working knowledge of how Local Area Networks communicate over a wide area. This course will introduce the student to telephony, the technology of switched voice communications. The course further provides students with an understanding of how communications channels of the public switched telephone networks are used for data communications, and how voice and data communications have become integrated. *Prerequisite: ICS 184 or consent of instructor.*	3	1						1				
ICS	187	Netprep TCP/IP Net Arch This course covers the operation of the TCP/IP standard and related protocols. The class will cover underlying components and protocols that make up the Internet. TCP/IP will be covered as well as the services that are provided by the Internet. Tools used to and access information on the Internet will be studied. Demonstrations will be given on some of the more popular Internet navigation tools used today, such as Internet Explorer and Netscape. Methods used to gain access to the Internet will also be covered. *Prerequisite: ICS 184 or consent of instructor.*	3	1						1				
ICS	190V	Topic: ICS	1	1								1		

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	193D	Cooperative Ed Provides practical work experiences in the computer area to apply classroom knowledge and develop job skills. May be part-time work in the private sectors of the business, government or industrial communities or may be directed study in a particular computer area. The student will meet with the instructor at least once a month and prepare written reports as directed. A student may take both courses for a total of six credits. *Prerequisite: Acceptance into the courses is by permission of the Instructor.*	3	1						1				
ICS	193P	Internship in ICS Not in catalog	1	1									1	
ICS	193V	Coop A&S Educ *Prereq: ICS 111 and consent of instructor and Co-op coordinator. Coreq: Enrollment in ECET program and one or more ELEC or ETRO courses. Recommended: ELEC 101 and 105, and ENG 100.* Reflects student interest area and the availability of job stations. Offers opportunity to upgrade workplace employability. 1-3cr., 1cr. per 75 hrs. supervised work *Note: Student, instructor, and employment supervisor jointly develop learning objectives. The instructor and the employment supervisor jointly evaluate student. Students can repeat ICS 193v for a maximum of 3 credits.*	1	1									1	
ICS	193V	Coop Ed Cooperative program between the student, an employer, and the College that integrates classroom learning with supervised practical experience. Reflects the student's major interest area and availability of job assignments. Offers the opportunity to develop workplace employability skills dependent on job assignments and course of study. (1-3 hrs. lect.) Prerequisite: Various as determined by the particular course of study and placement of the cooperative education/internship practicum in the sequence of courses.	1	1										1
ICS	197	Tech Sur Crse Not in catalog	1	1										1

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	197B	Intro to Windows and the Web Not in catalog	1	1				1						
ICS	197C	Intro to Word & PowerPoint Not in catalog	1	1				1						
ICS	197C	Programming in C Not in catalog	3	1						1				
ICS	197D	Programming in C++ Not in catalog	3	1						1				
ICS	197E	Intro Computer Graphics Not in catalog	3	1						1				
ICS	197F	Intro Input Devices Not in catalog	1	1									1	
ICS	197G	Netprep Local Area Net Not in catalog	3	1						1				
ICS	197I	Topics in Comp Sci This course presents topics which may vary from semester to semester. Its purpose is to maintain currency with rapidly changing computer technology in Hawaii. Possible topics include terms and concepts used in the computer industry. Concepts will be discussed, demonstrated, and exercised to provide an understanding of the technology and to assist students in making informed decisions in using the technology. Offered on an as-requested basis. *Prerequisite: ICS 100 or equivalent knowledge or consent of instructor.*	1	1						1				
ICS	197J	Netprep Trn the Trainer I This course introduces the student to the underlying concepts of Data Communications, Telecommunications and Networking. It focuses on the technology and technologies in current networking environments. It is meant to provide a general overview of the field of networking as a basis for continued study in the field. In addition, this course is designed to bring the student up to dated on the latest concepts of Local Area Network (LAN) technologies. It provides a comprehensive introduction to the concepts, technologies, components and acronyms inherent in today's local networking environments. Offered as an as-requested basis. *Prerequisite: None.*	3	1						1				

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	197K	Netprep Train The Trainer I This course combines the concepts of Wide Area Networks and TCP/IP. Students will learn the concepts, technologies, components, and protocols used to move voice and data across long distances, and discover important technologies such as ATM that integrate voice, data and video communications. Also reviewed are basic concepts of how information is transported over a wide area network (WAN), from the physical layer bits and bytes to the applications that WANs support. In addition, students will learn the underlying applications, components and protocols of transmission control protocol/Internet protocol (TCP/IP) and its necessary link to the Internet. This course will show how to identify TCP/IP layers, components, and functions. Navigation tools, and TCP/IP services. Troubleshooting methodologies are also covered. Offered on an as-requested basis. *Rec Preparation: ICS 197*	3	1						1				
ICS	197L	Structured Cabling Systems Telecommunications is a fast moving industry that is constantly evolving. This course will address the latest developments involving the EIA/TIA Telecommunications Commercial Building Wiring Standard and how it affects you. The standards are the foundation of the telecommunication industry. Offered on an as-requested basis. *Prerequisite: None*	3	1						1				
ICS	199	Independent Study Not in catalog	1	1						1				
ICS	199V	Directed Study Not in catalog	1	1								1		
ICS	199V	Ind/Directed Studies	1	1	1									
ICS	199V	Indepen Study Not in catalog	1	1									1	
ICS	199V	Independent Study Not in catalog	1	1				1						
ICS	199V	Special Studies Not in catalog	1	1			1							

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	202	Internet Programming Skills *Prerequisites: ICS 102 and 111* *CENT majors only.* This course introduces students to programming for Internet applications. Topics will include setting up various Internet services and writing small programs to support these services. Special emphasis will be placed on the World Wide Web and include cgi-bin, Java, and JavaScript programming. Students should be Internet-literate and have already taken a beginning programming course. (3 hrs. lect. per week)	3	1			1							
ICS	205	Photoshop/Illustrator *Prereq: ICS 100, or BCIS 161, or consent.* Introduces the basic tools and features of digital image editing, photo retouching, and color correction of images. Focuses on the fundamental drawing techniques of illustration graphics including pen tool paths, objects, and type. 3 cr., 3 hr. lect./lab	3	1								1		
ICS	211	Intro Comp Sci II This is a second course in programming. The course will cover topics subsequent to those covered in ICS 111. This course emphasizes data structures: lists, queues, stacks, binary trees (45 lecture hours). *Prerequisite: ICS 111 and ICS 141 or equivalent, all with a grade of C or better, or Instructor's consent.*	3	1						1				
ICS	211	Intro Computer Sci II *Prereq: ICS 111 with at least a C, or consent. Recommended: MATH 135.* Reinforces and strengthens problem solving using advanc ed features of computer programming languages and algorithms. Introduces students to the concepts and applications of computer data types, storage, sorting, retrieval, removal, and maintenance of data structures. Problem solving techniques are refined using high-level object-oriented programming languages and sophisticated programming techniques, recursive applications, and algorithms. *Meets ACM CS2 course standards.* 3cr., 3hr. lect./lab	3	1								1		

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	211	Intro to Comp Science II *Prerequisite: ICS 111* A second course in computer programming. Programming consists of data structures and algorithms together. The first course covers algorithms; this course emphasizes data structures: lists, stacks, queues, binary trees. The course conforms with the ACM (Association of Computing Machinery) description of CS-2. (3 hrs. lect. per week)	3	1			1							
ICS	211	Intro to Computer Science II *3 hours lecture per week* *Prerequisite(s): ICS 111; credit or concurrent enrollment in ICS 141* ICS 211 completes the coverage of material that is considered fundamental to a beginning student in computer science. The major areas emphasized are advanced features of programming languages, program correctness, algorithms for searching and sorting, data structures, including lists and binary trees, and introduction to the theory of computation. The programs are implemented in a structured language. The course meets the Association for Computing Machinery CS 2 course standards.	3	1				1						
ICS	211	Intro to Computer Science II Algorithms and their complexity, introduction to software engineering, data structures, searching and sorting algorithms, numerical errors. Pre: grade of "B" or higher in 111 or consent. All students wishing to enroll in ICS courses above 211 must meet the prerequisite grade requirement of B or higher in ICS 111 and 211 prior to registering for the course.	3	1							1			
ICS	211A	Intro to Computer Science II Not in catalog	3	1							1			
ICS	212	Program Structure A programming intensive course which covers program organization paradigms, programming environments, implementation of a module from specifications, the C and C++ programming languages. *Prerequisite: ICS-211 with a grade of "C" or better.*								1				

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	212	Program Structure Program organization paradigms, programming environments, implementation of a module from specifications, the C and C++ programming languages. Pre: 211 or consent.	3	1							1			
ICS	212	Program Structure *3 hours lecture per week* *Prerequisite(s): ICS 211 (may NOT be taken concurrently.)* ICS 212 focuses on program organization paradigms, programming environments, implementation of a module from specifications, C and C++ programming languages. This is a programming intensive course-students are expected to spend at least two hours outside of class writing and checking programs for every hour spent in class, and are expected to have at least six programming assignments spread throughout the semester. At least half of the programming assignments are to be done in the UNIX environment.	3	1				1						
ICS	215	Discrete Mathematics Not in catalog	3	1								1		
ICS	215	Network Administration *Prerequisites: CENT 140* *CENT majors only.* A course that covers network administration using a Novell NetWare network as a model. Students will learn to manage the hardware and software as well as setup users, directories, and security. Cross-listed as CENT 215. Credit may be received for only ICS 215 or for CENT 215 but not for both. (3 hrs. lect. per week)	3	1			1							
ICS	227	Networking with TCP/IP & Unix *Prerequisites: CENT 140* *CENT majors only.* A course that covers the essentials of netw orking computers using the TCP/IP protocol. The UNIX operating system will be used as the primary example of networking, although interoperability with other operating systems will be covered. Cross-listed as CENT 227. Credit may be received for only ICS 227 or for CENT 227 but not for both. (2 hrs. lect.; 3 hrs. lab. per week)	3	1			1							
ICS	240	Operating Systems Not in catalog	3	2			1			1				

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	241	Discrete Math For Comp Sci II *Prerequisites: ICS 111 and ICS 141* *Prerequisite or Corequisite: MATH 205 OR placement in MATH 206* Recursive algorithms, program correctness, structured programs, graph theory, trees and their applications, probability theory, Boolean algebra, introduction to formal languages and automata theory. (3 hrs. lect. per week)	3	1			1							
ICS	241	Discrete Math For Comp Sci II Recursive algorithms, program correctness, structured programs, graph theory, trees and their applications, probability theory, Boolean algebra, introduction to formal languages and automata theory. (45 lecture hours) *Prerequisite: ICS 111 and ICS 141.*								1				
ICS	241	Discrete Mathematics II Program correctness, recurrence relations and their solutions, divide and conquer relations, relations and their properties, graph theory, trees and their applications, Boolean algebra, introduction to formal languages and automata theory. Pre: 141 or consent. **FS**	3	1							1			
ICS	250	Intro Obj-Orient Prog This is an introductory course in object-oriented programming, designed for students with previous structured programming experience. It covers C++ syntax for standard input/output, arithmetic, conditional and iterative statements. It introduces the student to object-oriented design and implementation of classes, objects, functions, and methods. It also introduces the student to programming with graphical user interfaces. *Prerequisite: ICS 111 or ICS 135.*	3	1						1				
ICS	251	Adv Database Program A second course in programming database applications with emphasis on structured programming techniques in a multi-platform environment. An introduction to an object-oriented programming language is included and students learn to transport and convert data between minicomputer and microcomputer platforms. Development of large program systems is required (45 lecture hours). Prerequisite: ICS 151Z	3	1						1				

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	251	Intro to Unix/Linux *Prereq: ICS 100 with at least a C, or consent.* Introduces the Unix/Linux operating system with emphasis on the Red Hat Linux release. Covers the history and structure of Unix/Linus, basic functions, and fundamental commands. Explores advanced topics unique to Unix/Linux system administration. Stresses the ethics and responsibilities incumbent with Super User privileges. 4cr., 4hr. lect./lab	4	1								1		
ICS	252	Unix/Linux System Admin *Prereq: ICS 251 with at least a C, or consent.* Continues exploration of the Unix/Linux operating system with an examination of the tasks and responsibilities of system administration. Examines and explores the Unix group and user hierarchy, system security, networking fundamentals, network administration, system logs, troubleshooting, application installation, and system installation and maintenance. Emphasizes the ethics and responsibilities of Unix System Administration and root user privileges. 4 cr., 4hr. lect./lab	4	1								1		
ICS	258	Programming for HPC *Prereq: ICS 111 with at least a C, or consent* Explores programming for high performance computational clusters. Examines the algorithmic paradigms required to most efficiently and effectively create or modify code that will exploit the unique characteristics of parallel processing. Identifies the attributes common to highly parallelizable code. Develops parallel algorithms and writes implementing computer code. Tests, evaluates, and refines code to maximize performance and efficiency. 3cr., 3hr. lect./lab	3	1								1		
ICS	261	Intm Compter Graphics *Prereq: ICS 161 or consent.* Provides instruction with the tools and concepts of computer graphics utilizing digital media technology. Offers experience that integrates digital image editing, illustration graphics, print publishing, web authoring, 2D and 3D animation. 3cr., 3hr. lect./lab	3	1								1		
ICS	270	OC-System Analysis Not in catalog	3	1			1							

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	270	Systems Analysis A study of data processing systems and procedures including the advantages and disadvantages of different types of systems, forms, design, controls, conversion techniques and facilities planning. Emphasis on various techniques and tools of Systems Analysis, such as interviewing, procedure analysis and flowcharting. (45 lecture hours) *Prerequisite: ICS 111.*	3	1						1				
ICS	275	High Perf Cmptg Clustrs *Prereq: ICS 251 with at least a C, or consent.* *Coreq: ICS 252* Introduces High Performance Computing (HPC) clusters. Covers the history, technology, and structure of computational clusters, with emphasis on Beowulf -style clusters. Includes design concepts, software and hardware implementations, enabling applications, and administration. Includes algorithmic considerations and structures conducive to the development and implementation of parallelized applications. Provides experience building, configuring, and utilizing the cluster. 4cr.,4hr. lect./lab	4	1								1		
ICS	286	Applied System Analysis Not in catalog	3	1						1				
ICS	290	Netprep Intro Internet The Internet Technologies course begins with an overview of the Internet, its organization and structure. Once the general structure is understood, we look at different ways to access the Internet, both as an individual user and as a group of users. Web clients and servers and the underlying protocols used by both are also covered reviews the many applications that are used for retrieving information or providing information across this global network of networks. Current web server operating systems will be explored. *Prerequisite: ICS 184 or consent of instructor.* *Recommended Preparation: ICS 184, ICS 185, ICS 186 and ICS 187.*	3	1						1				

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	290V	Adv Topic: ICS *Prereq: Dependent on topic being covered* Covers current topics in computer science. Introduces students to topics of current interest relevant to their studies. Includes both theoretical and hands -on experience in cutting edge hardware, software, networking, operating systems, applications, and techniques. 3-4cr., lect./disc. or lect./lab	1	1								1		
ICS	291	Netprep Internetworking This is an advanced course intended for networking professionals and students who already grasp the general concepts of data communications and networking, but would like a more detailed understanding of internetworking. Techniques and components for managing network growth and connecting disparate network architectures will be presented and solutions to internetworking problems will be developed. *Prerequisite: ICS 184 or consent of instructor or Certificate of Completion in Basic Computer Networking.* *Recommended Preparation: ICS 184, ICS 185, ICS 186 and ICS 187.*	3	1						1				
ICS	292	Netprep Processes This is an advanced course intended for networking professionals and students who grasp the basic concepts of networking but would like to understand, in more detail, some of the major protocols controlling the flow of information between data communications layers and between cooperating processes on network nodes. Trace and analysis tools will be used to analyze the frames and packets traversing a network. *Prerequisite: ICS 184 or consent of instructor.* *Recommended Preparation: ICS 184, ICS 185, ICS 186 and ICS 187.*	3	1						1				
ICS	293D	Cooperative Ed Not in catalog	3	1						1				

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	293V	Internship in ICS *Prereq: ICS 193v, and ELEC 101 and 105 and ENG 100, and consent. Coreq: Enrollment in ECET program and one or more ELEC or ETRO courses. Recommended: MATH 135, and SP 151 or COM 145.* Reflects student interest area and the availability of job stations. Offers the opportunity to upgrade employment and problem-solving skills. 1-3cr., 1cr. per 75 hrs. supervised work *Note: Student, instructor, and employment supervisor develop learning objectives. The instructor and the employment supervisor jointly evaluate student. Student may repeat ICS 293v for a maximum of 6 credits.*	1	1								1		
ICS	294	Netprep Net Anal & Des The student will gain a more in-depth understanding of methods used to analyze, design and manage LANs and point-to-point networks. Exercises are geared toward learning techniques in network design and analysis. Network diagrams from several corporate networks will be analyzed and discussed. *Prerequisite: ICS 184 or consent of instructor. Recommended Preparation: ICS 184, ICS 185, ICS 186 AND ICS 187.*	3	1						1				
ICS	297	Adv Tools for the Info Age Not in catalog	3	1			1							
ICS	297B	Digital Imaging Not in catalog	3	1						1				
ICS	298	Special Topic in ICS *Prereq: ICS 252 with at least a C and ICS 275 with at least a C, or consent. Coreq: Determined by topic. Recommended: Determined by topic.* Covers current topics in computer science. Introduces students to topics of current interest and relevant to their studies. Includes both theoretical and handson experience in cutting edge hardware, software, networking, operating systems, applications, and techniques. 4cr., 4hr.	4	1								1		
ICS	299	Independent Study Not in catalog	1	1						1				
ICS	299V	Directed Study Not in catalog	1	1								1		
ICS	299V	Ind/Directed Studies	1	1	1									

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ICS	299V	Independent Study Not in catalog	1	1				1						
ICS	299V	Special Studies Not in catalog	1	1			1							
CS	100	Prin Of Computer Sci General survey of the entire field of computer science. Principles of machine architecture, human/machine interface, data organization, and their interrelationship.	3	1		1								
CS	101	Microcmptr Applctns Software Use of modern software applications, including e-mail, word processing, spreadsheets, presentations, database, and web page construction. Topics include creating and modifying documents, using formulas and charts in spreadsheets, creating presentations, and building tables, queries, forms, and reports in a database. Elementary programming concepts are introduced using VBA and HTML. Intended for business majors.	3	1		1								
CS	102	Microcmptr Apps for Sciences Use of symbols, equations, images in scientific documents. Computations using spreadsheets with sums, averages, and scientific functions. Data analysis: curve fitting, interpolation, statistics. Data presentation: visualization, charts, and graphs. Symbolic computation. Database processing: forms, queries, reports, VBA. Additional topics chosen from: real-time data acquisition, more advanced statistical methods, system simulation. Intended for science majors. (Same as MATH 111) (Satisfies a Quantitative Reasoning General Education requirement as a Mathematics course)	3	1		1								
CS	110	Visual Basic Programming An introduction to window-based programming using Visual Basic. Topics covered include the Visual Basic Environment, user-interface design, data types, scope, control structures, data structures, graphics, and software engineering.	3	1		1								

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
CS	150	Intro To Computer Science First course for computer science majors. A breadth-first introduction to the field of computer science; touches on algorithms and their analysis, digital circuits, Boolean logic, computer architecture and languages, operating systems and theory of computing. Introduces algorithm design and computer programming using structured and object-oriented design techniques. Develops a foundation of basic knowledge and programming skills necessary for further study in the field. Co-requisite: MATH 104 or MATH 205.	3	1		1								
CS	151	Intro To Software Development Continuation of CS 150. Recursion, dynamic memory allocation, sort/search, simple structured data types: strings, queues, lists, and trees. Program design, testing, and documentation. Pre: CS 150.	3	1		1								
CS	199V	Directed Studies Not in catalog	1	1		1								
CS	200	Web Technology I Introduction to web technology. Overview of web page design and the World Wide Web. introductory web page authoring and client-side programming. Elements of graphic design. Scripting an style languages for dynamic web pages.	3	1		1								
CS	201	Web Technology II Issues in intermediate web site design. Topics include: overview of web server programming; intermediate client-side programming (scripting, applets, and transforms); server-side programming such as scripting, dababases, servlets. Pre: CS 200 or consent of instructor.	3	1		1								
CS	215	Discrete Mathematics Topics from discrete mathematics, including logic, proof techniques, recurrence relations, set theory, c ombinatorics, relations, functions, graphs, Boolean algebra, finite-state machines. Not open to students with credit in MATH 310, Pre: MATH 205.	3	1		1								
CS	220	Business Data Processing Not in catalog	3	1		1								
CS	266	Comp Org & Assembly Lang Organization of computers; assembly language; instruction sets; CPU; memory; input/output;interrupts; DMA. Pre: CS 150	3	1		1								

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
CS	299V	Directed Studies Statement of planned reading or research required. Pre: sophomore standing and consent of instructor.	1	1		1								
ITS	102	Information Technology Tools fo Business ITS 102 builds on the IT major's prior knowledge of information technology applications (students are expected to be competent in word processing, Web browser and search, and PC navigation and file management before taking this course). The role of information technology in the continuing evolution of an information-based society is expanded upon. Students build on knowledge and skills garnered through prior classes or experience to develop business proficiencies in areas such as spreadsheet development and analysis and electronic presentations. Furthermore, students develop knowledge and skills in program logic and design; database creation and use; business teamwork; and Web page development. Students will also consider current legal and ethical issues related to information technology and business. The course includes structured group work, lectures, as well as hands -on use of computers to provide students with experiences in current business applications and methodologies. *(Effective Spring 2004)* *Prerequisite(s): IT Skills Placement Test; a grade of "C" or higher* *in ICS 100 or equivalent; credit or concurrent enrollment inENG 22 or qualification for ENG 100 or ENG 160; credit or concurrent enrollment in MATH 25 or qualification for MATH 103 or higher.*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	103	Intro to Programming Process ITS 103, the first course in programming, emphasizes the initial development of problem solving and logical skills in a business computing environment. Algorithms including flowcharts and programs are designed and implemented in the structured procedural style. Basic debugging and documentation techniques are also covered. *Prerequisite(s): Credit or concurrent enrollment in ITS 102; credit or concurrent enrollment in ENG 22 or qualification forENG 100 or ENG 160; credit or concurrent enrollment in MATH 25 or qualification for MATH 103 or higher level mathematics*	3					1						
ITS	103	Intro to Programming Process A first course emphasizing the development of problem solving and logical skills required to program in a business environment. Algorithms and programs are designed and implemented in the structured procedural style. Basic debuggin and documentation techniques are also covered. *CoReq: ICS 101 or prior completion with a "C" or better*		1										
ITS	104	Small Business Networking ITS 104 provides students with an overview of essential networking concepts, terminology and skills. The course gives students a fundamental understanding of the technological, business and legal issues related to a networked organization. Certification competencies related to the Windows desktop operating system will be covered. The course further introduces the student to security concepts such as cryptography, digital signatures, key management and authentication. *Prerequisite(s): ITS 102 or ICS 101; ITS103 or EBUS101* *Comment: This course may require hardware/software supplies for hands-on activities up to $50.00.*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	104	**Computer Hardware Support** The first course in computer support intended to provide the skills needed to prepare the student to support personal computer hardware. The course prepares the student to address the most common PC hardware concerns. It includes both concepts and hands-on real-world experience. *CoReq: ICS 101 or prior completion*	4	1	1									
ITS	108	**Computer Software Support** The second course in computer support intended to provide the skills needed to prepare the student to support personal computer hardware. The course prepares the student to address the most common PC hardware concerns. It includes both concepts and hands-on real-world experience. *CoReq: ITS 104*	3	1	1									
ITS	108	**Computer Software Support** not in catalog												
ITS	113	**Intro to SQL and Database Design** ITS 113 is an introduction to Structured Query Language (SQL) and database design. The course covers the tools needed to query and modify database objects. The course also introduces the student to database design concepts. A substantial part of the course involves the understanding of database design and the relationship between databases, tables, records and fields. The course includes hands-on use in a computer environment that provides the students with experience designing, creating, and manipulating a database using the appropriate information technology tools. *Prerequisite(s): ITS 102 or ICS 101; ITS 103 or EBUS 101*	3	1				1						
ITS	118	**Visual Basic for Business Apps** ITS 118, the second course in programming, introduces program development of business applications. Event-driven programming and object concepts are covered. *Prerequisite(s): ITS 102; ITS 103; MATH 25 or qualification for MATH 103 or higher level math; ENG 22 or qualification for ENG 100 or ENG 160*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	118	Visual Basic Progmng Bus. Apps A second course in programming introducing the development of business applications. Event-driven programming and object-oriented concepts are covered utilizing Visual Basic. Programming constructs, practices, and style are emphasized as well as program testing, debugging and documentation. *PreReq: "C" or better in ICS 101 and "C" or better in ITS 103*	4	1	1			1						
ITS	121	Computing Topics Introductory topics varying semester to semester to maintain currency with rapidly changing technologies in Hawaiʻi's business industry. Topics may include operating systems, specific hardware systems, other software packages and programming languages not covered in IT program courses. May be repeated for credit provided that a different topic is studies. *PreReq: variable per topic*	3	1	1									
ITS	121	Computing Topics not in catalog		1				1						
ITS	151	Applied Database Prog using VB ITS 151 is a course in developing interactive Database Management Systems (DBMS) using Visual Basic. This requires experience with Visual Basic programming in an interactive mode. Application requirements are explained through presentation of a set of data structures, or logical schema, for sample applications. Structured programming techniques, good programming style, and eventdriven programming are emphasized. Students will develop complete event-driven menu-based database systems. *Prerequisite(s): ITS 113; ITS 118; BUS 100; ENG 160; EBUS 220; ACC 101 or ACC 201*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	151	Applied Database Programming in an Object Oriented Environment] This is a course in developing interactive Database Management Systems (DBMS) in an Object Oriented Database Environment. This requires experience with object oriented programming in an interactive mode. Application requirements are explained through presentation of a set of data structures, or logical schema, for sample applications. Structured programming techniques, good programming style, and event driven programming emphasized. Students will develop complete event driven menu based database systems. *PreReq: "C" or better in ITS 118*	4	1	1									
ITS	155	COBOL ITS 155 develops the basic technical and logical skills a programmer needs to design and implement elementary structured COBOL programs. In addition to learning COBOL commands and features, students practice the application of problem solving and debugging skills to ensure accurate results. *Prerequisite(s): ITS 102; ITS 103*	3	1				1						
ITS	157	Web Site Development ITS 157 introduces the student to the Internet and its effects on modern society. Students will review its history, concepts, and terminology. Hands-on activities will include how to connect to and navigate the Internet, create World Wide Web pages, and develop World Wide Web sites. A variety of Internet resources will be demonstrated. *•Prerequisite(s): ENG 160; ITS 118; ITS 104; ITS 113; EBUS 220; BUS 100; ACC 101 or ACC 201*	3	1				1						
ITS	193	Info Technology Internship ITS 193 is a cooperative internship education course involving the student and an employer or the college that integrates classroom learning with supervised, structured practical experience. Students' interests, ITS program content and the availability of jobs are considered when making practicum assignments. Offers the opportunity to develop workplace soft skills as well as technical skills. *Prerequisite(s): BUS 100; ENG 160; consent of department chairperson or program coordinator*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	193	Coop Ed/Internship/Practicum ITS 193 is a cooperative internship education course involving the student and an employer or the college that integrates classroom learning with supervised, structured practical experience. Students' interests, Information Technology program content and the availability of jobs are considered when making practicum assignments. ITS 193 offers the opportunity to develop workplace assist students make informed decisions on upgrading network design and technology. *Prerequisite(s): BUS 100; credit or concurrent enrollment in ITS 151; credit or concurrent enrollment in ITS 155; credit or concurrent enrollment in ITS 157. Comment: Letter grade only. May not be taken for credit/no credit. May not be audited.*	3	1	1									
ITS	215	Network Administration In ITS 215, students will learn how to oversee the operation of a local area network. They will learn to manage the hardware and software as well as how to set up users, directories, and security. They will learn how to use higher-level system management features of a network operating system, including performance optimization, advanced printing, remote management, protocol support, and preventive maintenance. They will learn these skills through lecture sessions, exercises, hands-on training, and team projects. *Prerequisite(s): ITS 104; ENG 160; BUS 100; consent of department chair or program coordinator*	3	1				1						
ITS	215	Network Administration The setup and operation of a local area network utilizing Novell NetWare and/or Microsoft Windows NT. Managing hardware, software, file systems, user accounts, and security. System management for performance optimization, name space, protocol support, and preventative maintenance. *PreReq: "C" or better in ITS 104.*	4	1	1									
ITS	220B,C,D	Topics in Network Technologies Deleted Spring 2005	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	220E	Business PC system maintenance/ support and OS installation ITS 220E provides PC operating system and hardware concepts and hands -on activities relating to the following networking topics: operating system theory, current PC operating systems, various hard drive partitions, operating system installation and upgrading, peripheral device drivers, network connectivity, resource sharing over a network, construction, installation, upgrading, troubleshooting, and maintenance of hardware and software components of microcomputer systems. Course will cover specification, selection, installation and configuration of hardware components including memory, floppy disk drives, microprocessors, hard drives, CDs and CD-writers, video cards, LAN cards, sound cards, monitors, routers, switches, and printers as related to a business environment. *Prerequisite(s): ITS 104* *Comment: Hardware/software supplies for hands-on activities may cost up to $50.00.*	3	1				1						
ITS	220F	Small Business Windows Server Administration ITS 220F provides network business server operating system administration concepts and hands-on activities. Installation, configuration and maintenance will be covered in the context of a small business. ITS 220F will cover the following topics: overview of Windows Server and installation and configuration, including automated installation, remote installation, file systems, hard disk management, NTFS, security, active directory, organization units, containers, user and group account administration, group policies, network printers, network protocols, TCP/IP networking topics, DHCP, static and dynamic IP addressing, WINS, DNS, RRAS, Security, PKI, backup, resiliency, network management, consoles, applications servers, web environment, FTP, web servers, IIS, and terminal services. *Prerequisite(s): ITS 104; ITS 220E* *Comment: Hardware/software supplies for hands-on activitiesmay cost up to $50.00.*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	221	**Advanced Computing Topics** Advanced topics varying semester to semester to maintain currency with rapidly changing technologies in Hawai'i 's business industry. Topics may include advanced courses in programming languages or networking, systems analysis, electronic commerce and other topics as they emerge. May be repeated for credit provided that a different topic is studied. *PreReq: variable per topic*	3	1	1									
ITS	221 (alpha)	**Topics in System Development** ITS 221 presents system development topics which may vary from semester to semester. Its purpose is to maintain currency with rapidly changing technologies in Hawai'i's business industry. Topics may include object-oriented technologies using Java or C++, electronic imaging systems, commerce on the Internet, and other emerging technologies. *Prerequisite(s): ITS 151; ITS 157; ENG 160; BUS 100; consent of department chair or program coordinator of department chair or program coordinator.*	3	1				1						
ITS	221B	**Systems Analysis** ITS 221B surveys established and evolving methodologies for the development of business-oriented computer information systems. Students are exposed to an overview of a structured approach to the definition of needs, creation of specifications and implementation of new systems. Students will be introduced to the use of advanced software tools to assist in system design and application generation. *Prerequisite(s): ITS 151; ITS 157; ENG 160; BUS 100; consent of department chair or program*	3	1				1						
ITS	221C	**Java Applications Programming** ITS 221C develops the technical skills a programmer needs to design and implement Internet systems in the Java environment. Topics include the Java programming language and environment, object-oriented fundamentals, and information processing on the Internet. *Prerequisite(s): ITS 151; ITS 157; ENG 160; BUS 100; consent of department chair or program coordinator*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	221D	C++ Applications Programming I ITS 221D develops the technical skills a programmer needs to design and implement Internet systems in the C++ environment. Topics include the C++ programming language, C++ environment, and object-oriented fundamentals. *Prerequisite(s): ITS 151; ITS 157; ENG 160; BUS 100; consent of department chair or program coordinator*	3	1				1						
ITS	221E	Web Devel-Active Server Pages ITS 221E covers the back end Web processing using Active Server Pages (ASP) on Windows 95, 98 and NT Platforms. *Prerequisite(s): ITS 151; ITS 157; ENG 160; BUS 100; consent of department chair or program coordinator*	3	1				1						
ITS	221F	Databases ITS 221F develops the technical skills needed to design and implement a relational database in a client/server environment. Topics include the design and implementation of a relational database, Structured Query Language, database access from client applications, and database security. *Prerequisite(s): ITS 151; ITS 157; ENG 160; BUS 100; consent of department chair or program coordinator*	3	1				1						
ITS	221H	Java Apps Programming II ITS 221H is a second topic course in Java. It continues with the development of the technical skills a programmer needs to design and implement Internet systems in the Java environment. Topics include the advance features of the Java such as multithreading, multimedia, networking, Advanced AWT, JavaBeans, and Swing, and continued object-oriented programming, and information processing on the Internet. *Prerequisite(s): ITS 151; ITS 157; ENG 160; BUS 100; consent of department chair or program coordinator*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	221J	**C++ Apps Programming II** ITS 221J develops the technical skills a programmer needs to design and implement intermediate to advanced applications in the C++ environment. Topics include the C++ Programming language, the C++ Standard Library, C++ environment, and the application of object oriented principles and generic programming. Graphical interfaces to the C++ Language including Microsoft Foundation Classes, X windows, and Amulet are introduced. The use of the C++ language for network, internet, and web programming is also introduced. Students will learn how to build large projects from reusable components and libraries. Student projects may be undertaken to explore XML, SOAP, data visualization, Database development and networking topics. *Prerequisite(s): ITS 151; ITS 157; ENG 160; BUS 100; consentof department chair or program coordinator*	3	1				1						
ITS	221K	**Project Management** ITS 221K develops the technical skills an Information Technology professional needs to plan, manage or participate effectively in an IT project. Project Management terminology, concepts, tools and techniques will be presented with an emphasis on the effective use of information and people in an IT project. A semester-long group project will be used to reinforce the material, and students will give a formal presentation of their project to the class at the end of the semester. *Prerequisite(s): Consent of department chair or program coordinator*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	221M	Database Servicer Administration ITS 221M is designed to give the student a firm foundation in basic administrative tasks. The primary goal of this course is to give the student the necessary knowledge and skills to set up, maintain, and troubleshoot a network database. Students gain a thorough conceptual understanding of database architecture, and reinforce instructor-led learning with structured hands-on practices. The course uses challenge-level exercise labs providing practical experience. Additionally, bulletins from online support that address the most frequently asked questions are used to prepare participants to troubleshoot "real world" issues. *Prerequisite(s): ITS 113; ITS 221F* *Comment: Hardware/software supplies for hands-on activities may cost up to $50.00.*	3	1				1						
ITS	221N	Dynamic HTML ITS 221N focuses on Web design and creation. It expands on the IT students' earlier acquired skill set on HTML, CSS (Cascading Style Sheets), and Javascript. ITS 221N focuses on streamlined coding for design, dynamic content, and interactivity. Students will learn how to create Cascading Style Sheets that both control the layout and design of entire websites using a minimal amount of code, as well as create Dynamic HTML (DHTML) that changes both the content and format of Web pages depending on user input. *Prerequisite(s): ITS 157 or equivalent* *or consent of the instructorRecommended* *Preparation: Experience* *designing and coding Web sites.*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	221O	Game Programming I ITS 221O develops the skills necessary for producing interactive multimedia software in a collaborative environment. Students will examine the various technical aspects of multimedia and interactive software, and gain an understanding of project management, and team dynamics. Students will be led through a series of hands-on tasks using modern production-level software and hardware platforms. By the end of the course, the student will be expected to produce a mid-sized multimedia application, which can be used by the student as a portfolio project. *Prerequisite(s): EE 160, ITS 221D or ICS 212 or consent of instructor*	3	1				1						
ITS	221P	Game Programming II ITS 221P is designed to give the student a firm foundation is 3D graphics rendering and asset management. Extensive use will be made of current 3D SDKs (OpenGL, DirectX, etc.). By the end of the course, the student will be expected to produce a mid-sized interactive 3D application, which can be used by the student as a portfolio project. *Prerequisite(s): ITS 221O or consent of th e instructor*	3	1				1						
ITS	221Q	Advanced Database Programming with VB ITS 221Q Advanced Database Programming with VB develops the technical skills a programmer needs to design, develop, and implement multi-tier client-server database applications. Topics include advanced programming with the Visual Basic language, client-server applications, and databases. *Prerequisite(s): A grade of "C" or higher in ITS 151*	3	1				1						
ITS	255	Adv COBOL and Mainframe Apps ITS 255 develops the technical skills a programmer needs to design and implement advanced structured COBOL programs in a mainframe environment. Topics include multiple level tables, subprograms, VSAM files, Job Control Language and online systems. Students also prepare programs to run as production runs in a simulated work environment. *Prerequisite(s): ITS 155*	3	1				1						

Alpha	Number	Title	Credit	Total	HAW	HIL	HON	KAP	KAU	LEE	MAN	MAU	WIN	WOA
ITS	284	Data Comm Fundamentals Familiarizing students with the terms and concepts used in the computer networking industry. Providing them with a conceptual framework of data communications. Assisting students to understand computer networks and enabling them to make informed decision on network design and technology. PreReq: "C" or better in ITS 215.	3	1	1									