I

INFORMATION & COMPUTER SCIENCES

ICS 100 Computing Literacy and Applications (3) KCC AS/NS
3 hours lecture per week
Comment: Students may be required to purchase storage for electronic media to store data files and assignments created as course projects.

ICS 100 introduces students to computers and their role in the information world emphasizing computer terminology, hardware, and software. Opportunities for "hands-on" experience using applications software may include spreadsheets, word processing, presentations, communications, and databases.

Upon successful completion of ICS 100, the student should be able to:

- Utilize the basic features of computer applications to communicate effectively in the work environment.
  - o Produce documents in a variety of formats.
  - o Create, edit, and format electronic spreadsheets using simple formulas, functions, and charts.
  - o Create and organize a variety of electronic slides using templates, background styles, graphics, and animation effects.
- Utilize operating system interfaces to manage computer resources effectively.
- Utilize online resources for research and communication.
- Define, explain, and demonstrate proper computer terminology usage in areas such as hardware, software, and communications.
- Describe ethical issues involved in the use of computer technology.

ICS 100B: Introduction to Windows and the Web (1)
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 AS 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.

Upon successful completion of ICS100B, the student should be able to:

- Describe the concepts of an operating system.
- Demonstrate on a personal computer the common operating system features such as: shut down/start/restart the system, launch programs; navigate through folders and documents; determine file and folder properties; perform searches and maintenance activities such as create, copy, delete, and move.
- Communicate through electronic mail.
- Participate in a "threaded" Web discussion.
- Search for materials on the Internet via a WWW browser.
- Use File Transfer Protocol to download/ upload files through the Internet.

ICS 100BC Introduction to Windows, the Web, Word & PowerPoint (2)
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 AS 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 processors, 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.

Upon successful completion of ICS 100BC, the student should be able to:

- Describe the concepts of an operating system.
- Demonstrate on a personal computer the common operating system features such as: shut down/start/restart the system, launch programs; navigate through folders and documents; determine file and folder properties; perform searches and maintenance activities such as create, copy, delete, and move.
- Communicate through electronic mail.
- Participate in a "threaded" Web discussion.
- Search for materials on the Internet via a WWW browser.
- Use File Transfer Protocol to download/ upload files through the Internet.
- Use a word processor to produce documents and to perform simple desktop publishing.
- Use presentation software to communicate effectively with an audience.

ICS 100C Introduction to Word & PowerPoint (1)
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 ICS 100D may, in some cases, fulfill the Natural Science requirement for an AS 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.

Upon successful completion of ICS 100C, the student should be able to:

- Use a word processor to produce documents and to perform simple desk top publishing.
- Use presentation software to communicate effectively with an audience.

ICS 100D Introduction to Microsoft Excel (1)
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 AS degree.

ICS 100D is a non-technical introduction to spreadsheets and Microsoft Excel. Students will gain proficiency in the use of common spreadsheet software.

Upon successful completion of ICS100D, the student should be able to:

- Implement accounting worksheets that require the use of a spreadsheet program.
- Use a spreadsheet to present numeric information, to do analysis, and to graph data.
- Integrate the output of a spreadsheet into a word processor.
- Communicate through electronic media such as electronic mail and web-based discussions.

ICS 101 Digital Tools for the Information World (3)
3 hours lecture per week
Recommended Preparation: Keyboarding experience; credit or qualification for ENG 100, ENG 160 or ESL 100; credit or qualification for MATH 103 or higher level mathematics.
Comment: ICS 101 meets requirements for Shidler College of Business at University of Hawai`i at Manoa (UHM), College of Business at Hilo (UHH), School of Travel Industry Management (TIM) at UHM, and UHM's Biology program and Botany Department. Students are expected to provide their own USB compatible high density electronic storage media of minimum size of 128 MB or as specified by instructor.

ICS 101 provides hands-on computer instruction with an emphasis on producing professional-level documents, spreadsheets, presentations, databases, and Web pages for problem solving. This course includes concepts, terminology, and a contemporary operating system.

Upon successful completion of ICS 101, the student should be able to:

- Utilize the appropriate computer applications to produce professional-level documents, spreadsheets, presentations, databases, and web pages for effective communication (major content area)
    - o Produce documents in a variety of formats.
    - o Create, edit, and format electronic spreadsheets using formulas, functions, and charts.
    - o Utilize a database with queries and reports that display required data.
    - o Create and organize a variety of electronic slides using templates, background styles, graphics, photos, and animation effects.
    - o Create web pages that contain hyperlinks and images that are suitable for publication.
- Utilize operating system interfaces to manage computer resources effectively.
- Extract and synthesize information from available Internet resources using intelligent search and discrimination.
- Define, explain, and demonstrate proper computer terminology usage in areas such as hardware, software, and communications to effectively interact with other computer users and to prepare for higher-level computer courses.
- Describe ethical issues involved in the use of computer technology.

ICS 102 The Internet (3)
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.

Upon successful completion of ICS 102, the student should be able to:

- Define the Internet.
- Discuss the history of the Internet.
- Explain the terminology of the Internet.
- Explain how the Internet works.
- Connect to the Internet.
- Operate the operating system used to connect to the Internet.
- Navigate through various Internet resources to process e-mail, access and provide information, and communicate with other networks.
- Explain the social impact of the Internet.
- Describe current problems of the Internet.
- Describe the future of the Internet.
- Create Basic HTML pages and Websites with a simple text editor.

ICS 110 Introduction to Programming through 3D Animations (3)
3 hours lecture per week
Recommended Preparation: Keyboarding experience; MATH 25; ENG 22; ICS 101.

ICS 110 is an introduction to programming with user-friendly software (Alice). Students use storyboarding design strategies and create Disney/ Pixar-like animations and simple games with objects in 3D virtual worlds. These projects promote an understanding of basic object oriented programming constructs through the use of a drag and drop interface that manipulates 3D animated objects. Introductory projects based on contemporary music, Hawaiian and Pacific themes for students with or without programming experience will be emphasized.

Upon successful completion of ICS 110, the student should be able to:

- Apply basic object oriented programming design principles.
- Apply the concepts of object-oriented programming such as Classes, Objects, Methods, and Parameters.
- Apply the concepts of event-driven programming techniques in a game simulation environment.
- Apply functions and control statements such as If/Else, Definite and Indefinite Loops, Recursion.
- Use and process Lists.
- Use Variables and Arrays.

ICS 111 Introduction to Computer Science I (3) KCC AS/NS

3 lecture hours per week
Recommended Preparation: ICS 101 or equivalent.
Comment: ICS 111 is intended for Computer Science majors and others interested in the first course in programming. Students are expected to provide their own USB compatible high density electronic storage media of minimum size of 128 MB or as specified by instructor.

ICS 111 is an overview of the fundamentals of computer science emphasizing problem solving, algorithm development, implementation, and debugging/testing using an object-oriented programming language.

Upon successful completion of ICS 111, the student should be able to:

- Use an appropriate programming environment to design, code, compile, run and debug computer programs.
- Solve basic problem by analyzing problems, modeling a problem as a system of objects, creating algorithms, and implementing models and algorithms in an object-oriented computer language (classes, objects, methods with parameters, abstract classes, interfaces, inheritance and polymorphism).
- Illustrate basic programming concepts such as program flow and syntax of a high-level general purpose language.
- Identify relationships between computer systems, programming and programming languages.
- Manipulate primitive data types, strings and arrays.

ICS 141 Discrete Mathematics for Computer Science I (3) KCC AA/FS

3 hours lecture per week
Prerequisite(s): Qualification for MATH 135 or consent of instructor.

ICS 141 includes logic, sets, functions, matrices, algorithmic concepts, mathematical reasoning, recursion, counting techniques, probability theory.

Upon successful completion of ICS 141, the student should be able to:

- Solve problems in propositional logic, work with truth tables, and use Venn diagrams.
- Solve problems in elementary set theory.
- Prove theorems using mathematical induction.
- Use the formulas for permutations, combinations, and binomial coefficients.
- Perform general analysis of algorithms..
- Use recursive algorithms.
- Solve problems in elementary probability
- Solve elementary problems of relations
- Explain the concept of functions
- Solve basic matrix operations

ICS 211 Introduction to Computer Science II (3)

3 hours lecture per week
Prerequisite(s): A grade of "B" or higher in ICS 111 or consent of the instructor.

ICS 211 reinforces and strengthens problem-solving skills using more advanced features of programming languages and algorithms such as recursion, pointers, and memory management. ICS 211 emphasizes the use of data structures such as arrays, lists, stacks, and queues.

Upon successful completion of ICS 211, the student should be able to:

- Recognize the use of arrays, lists, stacks, queues, and other data structures.

- Select the appropriate searching or sorting algorithm based on the algorithm's behavior.
- Develop recursive algorithms and programs.
- Select appropriate data structure for a given application.
- Use advanced object-oriented programming techniques (polymorphism, inheritance, and encapsulation) and standard libraries.
- Produce robust programs using exception handling and extensive program testing.
- Create a simple graphical user interface (GUI) program.

ICS 212 Program Structure (3)
3 hours lecture per week
Prerequisite(s): A grade of "B" or higher in ICS 211 or consent of Instructor.
Comment: Students are expected to provide their own USB compatible high density electronic storage media of minimum size of 128 MB or as specified by instructor.

ICS 212 focuses on program organization paradigms, programming environments, implementation of a module from specifications, and the C and C++ programming languages.

Upon successful completion of ICS 212, the student should be able to:

- Complete programming exercises involving complex algorithms.
- Use Emacs, a debugger, the Unix utility "make", and the compiler in the Unix environment.
- Write programs using the features of C that are similar to Java, and in particular using character variables that require programs of 50 to 200 lines.
- Use pointers in C, C structures, linked data structures, and recursion.
- Use the C++ features that are similar to Java, including classes and inheritance.
- Write a program in C++ that involves linked data structures and recursion.
- Use overloading of operators by writing a non-trivial program that involves overloading of operators.
- Use memory management by writing a non-trivial program that requires memory management (constructors, destructor, and overloading assignment).
- Use standard C++ strings by writing a non-trivial program using standard C++ strings.
- Use the STL Library by writing a program that uses some other facilities provided by the C++ STL library, such as STL lists.

ICS 241 Discrete Mathematics for Computer Science II (3) KCC AA/FS
3 hours lecture per week
Prerequisite(s): ICS 111; ICS 141, or consent of instructor.

ICS 241 includes program correctness, recurrence relations and their solutions, divide and conquer relations, graph theory, trees and their applications, Boolean algebra, introduction to formal languages and automata theory.

Upon successful completion of ICS 241, the student should be able to:

- Use boolean algebra to realize logic circuits.
- Use graphs, paths, cycles and trees
- Solve simple recurrence relations
- Explain the concept of formal languages and finite-state machines
- Use concepts and techniques in program correctness to perform simple program validation.

INTERDISCIPLINARY STUDIES

IS 103 Introduction to College (3)
3 hours lecture per week
Recommended Preparation: Instructor recommendation, or qualification for, or concurrent enrollment in ENG 22 or ESOL 94.

IS 103 serves as an introduction to the college experience for first year and returning college students. Students identify their short and long-range

personal, college and career goals, while writing and revising an educational plan. Students document their daily activities as they develop self-management, critical thinking and learning skills.

Upon successful completion of IS 103, the student should be able to:

- Identify short and long-range personal and college goals, and prepare an educational plan to meet those goals.
- Re-evaluate and revise short and long-range personal and college goals and their educational plan to meet those goals.
- List college facilities, policies, programs and services that can assist in achieving educational goals.
- Use college level note-taking, critical reading, test taking, memory and concentration techniques.
- Use time management, personal organization, stress management and study skills.
- Identify and use academic support areas of the college.
- Become actively involved in campus and/or community activities.
- Use appropriate technology for conducting research and conveying ideas.
- Communicate effectively in writing and speaking.
- Find information from library, Internet, and other sources.
- Research occupations and use decision-making processes in selecting a career.
- Use strategies to complete out-of-class work efficiently and effectively.

IS 105B Career Decision Making (2) KCC AS/SS
3 hours lecture per week for 10 weeks
Recommended Preparation: ENG 22 or higher level English.

IS 105B is designed to assist students in making a tentative career choice and related educational decision. The course will focus on exploring interests, skills, values, and understanding the world of work. It also emphasizes learning the career/life development process, which, once learned will prepare students to cope with additional career/life decisions in later life.

Upon successful completion of IS 105B, the student should be able to:

- Describe the process of career development.
- Discuss the role their self-concept plays in career decision making.
- Identify and prioritize their own interests, skills, personality traits, and values.
- Demonstrate the ability to use values clarification, decision making, and time management techniques in developing an individual career/life plan.
- Reduce their career interests to a few options for continued exploration.
- Describe the changing roles of men and women in the work force.
- Explain federal laws regarding age, sex and other discriminations.
- Discuss the numerous resources available to them for engaging in career exploration.
- Define in class discussion and written examinations the terms and concepts relevant to career/life exploration and planning.
- Explain why career decision making is a lifelong process.

IS 105C Job Search Skills (1) KCC AS/SS
3 hours lecture per week for 5 weeks
Recommended Preparation: ENG 22 or higher level English.

IS 105C is designed to assist students in developing job readiness skills. It includes skills identification, resume preparation, and interview techniques.

Upon successful completion of IS 105C, the student should be able to:

- Describe the process of career development.
- Discuss the role their self-concept plays in career decision making.
- Identify transferable skills and skills needed for a specificc career.
- Assess work environment that relates to the student's own interests, values, and attitude.
- Utilize the decision making process in selecting a job for which the student will be interviewed.
- Describe the changing roles of men and women in the work force.
- Explain federal laws regarding age, sex and other discriminations.
- Demonstrate awareness if the non-traditional career opportunities available in Hawai'i and the nation.
- Identify and use standard and electronic sources of career information.
- Understand the importance and purpose of writing a resume.
- Demonstrate knowledge of appropriate job interview techniques.

IS 107 Student Success (1)
1.5 hours lecture per week for 10 weeks
Prerequisite(s): Qualification for ENG 100 and MATH 24.

IS 107 is a comprehensive student success course designed to promote effective academic strategies and the importance of personal responsibility in college and life success.

Upon successful completion of IS 107, the student should be able to:

- Develop and apply academic study skills in areas such as the following: Manage personal time, practice effective listening comprehension skills, take organized and meaningful notes from lectures and texts, practice effective textbook reading skills, identify different types of learning styles and be knowledgeable about own learning styles/ preferences, prepare to successfully complete exams, identify and effectively manage stress/ stressors and incorporate personal balance to enhance college success.
- Identify personal values in relation to life planning and goal setting.
- Explain the value and importance of personal responsibility in academic and life success.
- Identify resources, relationships, and survival skills that facilitate academic and life success.
- Realistically assess challenges of, and progress toward meeting, academic and life goals.
- Monitor and take ownership of individual academic progress.
- Communicate effectively on academic and individual matters with instructors, counselors, and peers.
- Organize information, plan, solve problems, and think critically in academic and life situations/contexts.

IS 114 Career Exploration in Education through Tutoring (3)
3 hours lecture per week
Prerequisite(s): Qualification for ENG 100; TB clearance.
Comment: Students enrolled in the course must have a current (within the past 12 months) TB clearance and be willing to submit to background checks for security reasons.

IS 114 provides students with information about English and math literacy tutoring from pre-kindergarten through college levels. Students will be required to tutor at a school in the grade level of their choice.

Upon successful completion of IS 114, the student should be able to:

- Identify causes and effects of illiteracy.
- Cite current local and national statistics on illiteracy.
- List strategies to enhance brain development in children from 0-3 years of age.
- Identify developmental milestones for students from 0-18 years of age.
- Create an informal inventory for measuring students' literacy.
- Demonstrate techniques for successful English and Math tutoring.
- Identify learning styles and their implications for creation of lesson to be used in tutoring.
- Apply the problem-solving process in tutoring situations.
- Establish effective tutoring relationships.
- List his/her own strengths and weaknesses in communication and relating to students and set goals for improving areas of weakness.
- Identify skills needed by pre-kindergarten and primary, middle and secondary, and college-level tutors.
- Demonstrate understanding of changes required in tutoring needed to support the needs of students whose first language is not English.
- Demonstrate understanding of changes required in tutoring to support students with special educational needs.
- Demonstrate knowledge of a tutor's role, responsibility, and liability.
- Communicate effectively with teachers or professors and school administrators.
- Define reading and the reading process.
- Identify, demonstrate understanding of, and become proficient in the use of various tutoring strategies.
- List key differences in primary, secondary, and college- level tutoring.
- Demonstrate group leadership ability in primary, secondary or college educational settings.
- Identify and use various sources to obtain age appropriate reading material.
- Identify and use various web sites, which provide current literacy information.

INFORMATION TECHNOLOGY

ITS 102 Information Technology Tools for Business (3)
3 hours lecture per week
Prerequisite(s): A grade of "C" or higher in ICS 100 or equivalent or a satisfactory score in the Information Technology Skills Placement Test; credit or concurrent enrollment in ENG 22 or qualification for ENG 100, ENG 160, or ESL 100; qualification for MATH 103 or higher level mathematics course or credit or concurrent enrollment in MATH 25, MATH 81, or BUS 100.

ITS 102 course builds on the Information Technology 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.

Upon successful completion of ITS 102, the student should be able to:

- Work within a team setting to solve a business problem using appropriate Information Technology tools.
- Use presentation software to communicate effectively with an audience.
- Use diagramming software to illustrate logical processes.
- Use a spreadsheet to solve financial problems collaboratively.
- Use Web design tools to create a simple Web page.
- Define basic database concepts and terminology.
- Define numbering systems such as binary and hexadecimal and simple logical operators.

ITS 124 Small Business Networking (3)
3 hours lecture per week
Prerequisite(s): Qualification for ENG 22 or ESOL 94 or higher; qualification for MATH 24 or higher.
Recommended Preparation: Previous computer experience.
Comment: ITS 124 may require hardware/software supplies for hands-on activities up to $50.00. ITS 124 was formerly ITS 104.

ITS 124 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.

Upon successful completion of ITS 124 the student should be able to:

- Work effectively in teams.
- Manage networking projects.
- Identify the elements of, and uses for, a computer network in a small business.
- Identify the prominent networking standards organizations.
- Use the Windows desktop operating system.
- Identify the characteristics of popular networking protocols such as TCP/IP, IPX/SPX, NetBIOS and AppleTalk.
- Use addressing schemes of popular networking protocols.
- Explain the benefits and limitations of different networking media.
- Install network cabling in various topologies using industry-standard practices.
- Install network interface cards and their software drivers.
- Use common TCP/IP tools such as PING, TELNET and DNS.
- Discuss issues relating to network maintenance, integrity and security.
- Define Intranets, Extranets, and Virtual

Private Networks.
- Identify the business and legal principles related to an electronic commerce transaction.
- Discuss information security technologies such as cryptography, digital signatures, key management and authentication.

ITS 128 Introduction to Problem Solving (3)
3 hours lecture per week
Prerequisite(s): Qualification for ENG 22 or higher; qualification for MATH 24 or higher.
Comment: ITS 128 was formerly ITS 103.

ITS 128 is an introductory course in the development of problem solving and logical skills used in a business computing environment. Step-by-step logic are diagrammed into flowcharts and implemented in computer programs in a language deemed most appropriate for this course. Emphases are on valid solution designs and correct language syntax usage. Basic programming structures and concepts, common to all programming languages, are major components of this course.

Upon successful completion of ITS 128, the student should be able to:
- Identify flowcharting and programming as problem-solving processes
- Describe the steps in the development of a solution to a computing problem
- Implement the basic constructs (sequence, decision, and looping) of a structured solution to solve a problem
- Develop logic in the form of block flowcharts to solve a problem
- Analyze block flowcharts for validity
- Translate the block flowchart into a program using a programming language appropriate for the course
- Debug programs to ensure accurate results
- Design system flowcharts
- Write effective documentation

ITS 129 Introduction to Databases (3)
3 hours lecture per week
Prerequisite(s): Qualification for ENG 22 or ESOL 94 or higher; qualification for MATH 24 or higher.
Comment: ITS 129 was formerly ITS 113.

ITS 129 is an introduction to databases. 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 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.

Upon successful completion of ITS 129, the student should be able to:
- Define a relational database
- Define common database terminology such as tables, records, fields, keys, views and relationships
- Describe the database design process
- Define advantages of good database design
- Define a database and describe the main logical differences between traditional files and databases
- Define a database management system (DBMS) and describe relationships of DBMS to a database and to users
- Use Structured Query Language to manipulate data
- Identify SQL standards
- Design simple relational database with proper documentation
- Create a database schema
- Work effectively in teams
- Manage projects.

ITS 144 Business PC System Maintenance/ Support and OS Installation (3)
Prerequisite(s): ITS 124 or consent of the instructor or BE department chair.
Comment: ITS 144 may require hardware/software supplies for hands-on activities up to $50.00. ITS 144 was formerly ITS 220E.

ITS 144 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.

Upon successful completion of ITS 144, the student should be able to:

- Describe the types of operating systems currently in use by businesses
- Describe the functions of operating systems
- Define general operating system terminology
- Describe the basic features and characteristics of PC processors and their operating systems
- Demonstrate basic functions and features of DOS, Linux, Windows 95, 98, 2000 server, XP, .NET
- Install an operating system
- Upgrade to a new operating system
- Install peripheral devices and device drivers
- Assemble, maintain, troubleshoot various PC hardware components
- Perform file system and disk maintenance.

ITS 148 Visual Basic I (3)
3 hours lecture per week
Prerequisite(s): ITS 128 or consent of instructor or BE department chair.
Comment: ITS 148 was formerly ITS 118.

ITS 148 is an introductory course in using the programming language Visual Basic .NET to provide viable computing solutions in a business environment. It is assumed that the student is familiar with computing programming. Applications with forms, controls, and code are developed in an IDE (Integrated Development Environment) and run to test their validity. Introductory object oriented programming concepts are emphasized and realized through the creation of user defined classes and their properties and methods. Data validation and general procedure development are also components of this course.

Upon successful completion of ITS 148, a student should be able to:

- Explain the concept of event-driven programming
- Explain the basic concepts of objects in programming
- Solve business application problems using event-driven programming and objects
- Write, test, and debug event-driven programs
- Document event-driven programs.

ITS 149AD Database Administration I (3)
3 hours lecture per week
Prerequisite(s): ITS 129 or consent of the instructor or BE department chair.
Comment: ITS 149AD was formerly ITS 221F.

ITS 149AD is designed to give students a firm foundation in basic database administration. In this class, students learn how to install and maintain a database server. They will gain a conceptual understanding of database server architecture and how its components work and interact with one another. They will also learn how to create an operational database and properly manage the various structures in an effective and efficient manner including performance monitoring, database security, user management, and backup/recovery techniques.

Upon successful completion of ITS 149AD, the student should be able to:

- Install the Database
- Back up and Recover Data
- Administer Users
- Transport Data between Databases
- Manage Data
- Configure the Network

ITS 155 COBOL (3)
3 hours lecture per week
Prerequisite(s): ITS 103.

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.

Upon successful completion of ITS 155, the student should be able to:

- Identify basic commands and features of the COBOL programming language.
- Design, write and run elementary structured COBOL programs for business application problems ranging from simple listings to data validation, control level breaks, and sequential file updating.
- Analyze and debug COBOL programs to ensure accurate results.
- Use interface technologies to create, modify, and run COBOL programs.
- Document programs and systems created by the student.

ITS 220 (Alpha) Topics in Networking Technologies (3)
3 hours lecture per week, 6-9 hours per week of assignment directed hands-on computing activities
Prerequisite(s): ITS 104.

ITS 220 (Alpha) presents network technology topics(s) that may vary from semester to semester. Its purpose is to maintain currency with rapidly changing network technologies in Hawai'i's business computer industry. Possible topics include familiarization with the terms and concepts used in the computer networking industry and an opportunity to provide students with a conceptual framework of data communications. Students will have the opportunity to apply the skills learned in ITS 104, such as changes in upgraded Networking Operating System features, functionality, and interfaces, and the opportunity to install and configure the Network Operating System, upgrade servers, and install client software and protocols. Concepts will be discussed, demonstrated, and exercised to provide an understanding of networking technologies and to assist students make informed decisions on upgrading network design and technology.

Upon successful completion of ITS 220 (Alpha), for the networking technology(s) chosen, the student should be able to:

- Describe its history.
- Define its terminology.
- Describe its concepts and features.
- Use networking technology vocabulary.
- Use hardware and software components required for data communications.
- Demonstrate the practical application of skills in the installation, configuration, and management of the networking technology.
- Evaluate the implementation of the technology for efficiency and effectiveness.
- Describe its relationship to other networking technologies.
- Describe its impact on current business practices.

ITS 220F Topics in Networking Technologies: Small Business Windows Server Administration (3)
3 hours lecture per week
Prerequisite(s): ITS 104; ITS 220E.
Comment: Hardware/software supplies for hands-on activities
may cost up to $50.

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.

Upon successful completion of ITS 220F, the student should be able to:

- Describe the types of small business server operating systems currently in use.
- Describe the functions of server operating systems.
- Define general server terminology.

- Describe the basic features and characteristics of PC processors and their operating systems.
- Demonstrate basic features of a Windows based server.
- Install a server operating system and manage a network domain.
- Install and configure networked printers and other shared peripherals.
- Create user accounts and groups.
- Describe basic server security.
- Administer group policies.
- Describe various server based services.
- Perform administrative duties on a server.

ITS 220S PC & Network Security and Safeguards (3)
3 hours lecture per week
Prerequisite(s): ITS 104.

ITS 220S focuses on the principles of PC &Network security in small and home businesses. The course covers both hardware and software security issues and solutions, both peer-to-peer and server networks, network and Internet security as well as internal business security, data content, email, and physical security. Preventive security and disaster recovery are addressed. Common risk assessment strategies are developed with adaptations for various business situations to assist the student in developing security plans for various business situations. Common security tools are explored. The course covers basic communication security, infrastructure security, cryptography basics, computer forensics, common security issues faced by computer users with hands on labs to reinforce many of the security tools covered.

Upon successful completion of ITS 220S, the student should be able to:

- Implement network security measures
- Create a secure computer networking environment applying commonly used network and PC security principles
- Authenticate and log attacks and malicious code that may be used against a network
- Employ countermeasures for e-mail threats including digital identification
- Employ common Web security applications
- Perform remote access using remote desktop, remote management software and protocols, accessing servers through firewalls
- Secure file and print services
- Employ various security topologies
- Evaluate appropriate technologies for providing secure communications channels such as VPN or virtual private networking, PGP
- Secure internet-working devices and network media
- Deploy intrusion detection systems
- Implement firewalls, both hardware and software
- Implement physical security concepts and create a physical risk assessment plan for a small business
- Create security policies
- Prepare a disaster recovery plan
- Evaluate computer security using techniques such as computer forensics, tracking and logging
- Manage and troubleshoot security technologies

ITS 221 (Alpha) Topics in System Development (3)
3 hours lecture per week
Prerequisite(s): ITS 151 and a grade of "C" or higher in all ITS 221 prerequisites of the same topic; or consent of the Business Education Department Chairperson, program coordinator, or instructor.
Comment: A student may not repeat the same topic course. A student may enroll in a maximum of three ITS 221 courses (two courses as Information Technology specific electives, one course as an elective) to satisfy the AS degree requirements for ITS.

ITS 221 (Alpha) presents system development topics that may vary 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 others as they emerge.

Upon successful completion of ITS 221 (Alpha), for the technology(s) chosen, the student should be able to:

- Describe its history.
- Define its terminology.
- Describe its concepts and features.
- Apply skills in the creation and management of a system.
- Evaluate the implementation of the system for efficiency and effectiveness.

- Describe its relationship to other technologies.
- Describe its impact on current business practices.

ITS 221B Topics in System Development: Systems Analysis (3)
3 hours lecture per week
Prerequisite(s): ITS 151 and grade of "C" or higher in ITS 221G (ITS 157) or consent of Business Education Department Chairperson, program coordinator or instructor.

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.

Upon successful completion of ITS 221B, the student should be able to:

- Demonstrate different ways of organizing programs including modular programming from specifications, pipes/filters, command language processors, and pattern matching.
- Demonstrate enhanced programming skills in the C and C++ programming languages.
- Understand the effective use of programming tools and programming environments.
- Explain the role of the systems analyst.
- Describe the role, functions, and importance of information within a management context.
- Describe the reasons for, values of, and potential shortcomings involved in the traditional life-cycle approach to systems development.
- Demonstrate an understanding of modern methodologies for systems development.
- Explain the role of users in systems development and methodologies for interaction between users and systems analysts.
- Partition a system into a series of modules for solution of the stated problem.
- Use the tools and techniques of systems development.
- Work with Computer Aided Software Engineering (CASE) software.
- Participate in the analysis, design, development and implementation of a system.

ITS 221C Topics in System Development: Java Applications Programming (3)
3 hours lecture per week
Prerequisite(s): ITS 151 or consent of the Business Education Department Chairperson, program coordinator, or instructor.

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.

Upon successful completion of ITS 221C, the student should be able to:

- Design and implement applications in the Java environment.
- Analyze and debug Java programs to ensure correct results.
- Use object-oriented concepts in program design and implementation.
- Develop Java applications to perform Internet activities.

ITS 221D Topics in System Development: C++ Applications Programming I (3)
3 hours lecture per week
Prerequisite(s): ITS 151 or consent of the Business Education Department Chairperson, program coordinator, or instructor.

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.

Upon successful completion of ITS 221D, the student should be able to:

- Design and implement C++ applications.
- Analyze and debug C++ programs to ensure correct results.
- Use object-oriented concepts in program design and implementation.
- Use pointers to allocate and deallocate memory.

ITS 221E Topics in System Development: Web Development - Active Server Pages (3)
3 hours lecture per week
Prerequisite(s): ITS 151 and a grade of "C" or

higher in ITS 221G (ITS 157) or consent of Business Education Department Chairperson, program coordinator or instructor.

ITS 221E covers the back end Web processing using Active Server Pages (ASP) on Windows 95, 98 and NT Platforms.

Upon successful completion of ITS 221E, the student should be able to:

- Describe the Active Server Pages Object Model.
- Design Web Pages using Active Server Pages to handle processing on the Server.
- Send information from the client machine to the server for processing.
- Connect and interface with a simple database such as Microsoft Access.

ITS 221H Topics in System Development: Java Applications Programming II (3)
3 hours lecture per week
Prerequisite(s): Consent of Business Education Department Chairperson, program coordinator or ITS 151 and ITS 221C with a grade of "C" or higher.

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.

Upon successful completion of ITS 221H, the student should be able to:

- Design and implement applets in the Java environment.
- Understand concepts involving multithreading, multimedia, JavaBeans, and Swing.
- Use the Java Programming environment to develop programs.
- Write programs using one or more advance features of Java.

ITS 221J Topics in System Development: C++ Applications Programming II (3)
3 hours lecture per week
Prerequisite(s): Consent of Business Education Department Chairperson, program coordinator, or instructor or ITS 151 and ITS 221D with a grade of "C" or higher.

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.

Upon successful completion of ITS 221J, the student should be able to:

- Design and implement C++ applications using one or more advanced features of C++.
- Analyze and debug C++ programs using visual and non-visual debugging tools.
- Apply object-oriented principles and object oriented design.
- Understand how to use the principle of generic programming.

ITS 221K Topics in System Development: Project Management (3)
3 hours lecture per week
Prerequisite(s): ITS 151 or consent of Business Education Department Chairperson, program coordinator, or instructor.

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.

Upon successful completion of ITS 221K, the student should be able to:

- Demonstrate an understanding of the genesis of project management and its importance to improving the success of information technology projects.
- Demonstrate knowledge of project management terms and techniques.
- Apply project management concepts by working on a semester-long group project as team leader or active team member.
- Use Microsoft Project 2000 and other software to help plan and manage a project.
- Demonstrate an understanding of motivation theory and team building techniques.
- Use common tools and techniques of project management including: project selection methods, work breakdown structures, network diagrams, critical path analysis, and critical chain scheduling, cost estimates, and earned value management.
- Demonstrate competence in giving oral presentations.

ITS 221M Topics in System Development: Database Server Administration (3)
3 hours lecture per week
Prerequisite(s): ITS 151 and ITS 221F with a grade of "C" or higher or consent of Business Education Chairperson. program coordinator, or instructor.
Comment: Hardware/software supplies for hands-on activities
may cost up to $50.

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.

Upon successful completion of ITS 221M, the student should be able to:

- Create and populate a database.
- Start up and shut down a database.
- Manage tablespaces.
- Configure rollback segments.
- Monitor space allocation.
- Create user accounts with appropriate privileges and resources.
- Partition tables and indexes.
- Detect and eliminate migrated rows.
- Back up and restore databases.
- Recover from disk failure.
- Eliminate chaining and optimize database storage.

ITS 221N Topics in System Development: Dynamic HTML (3)
3 hours lecture per week
Prerequisite(s): ITS 151 and a grade of "C" or higher in ITS 221G (ITS 157) or consent of the Business Education Department Chairperson, program coordinator or instructor.
Recommended Preparation: Experience designing and coding Web sites.

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.

Upon successful completion of ITS 221N, the student should be able to:

- Convert an existing Web page without CSS to one that uses CSS.
- Style public Web documents, such as a Press Release or an Events Calendar, for a business.
- Style documents for print.
- Style attractive input forms.
- Style for multicolumn layouts.
- Overlap various elements on a Web page to achieve different stylistic effects.
- Create and debug Javascripts for Web pages.
- Use the DHTML Object Model.
- Create DHTML Web pages based on the end user's input and environmental variables.
- Hide and show Web page elements depending on the end user's input using CSS and Javascipt.
- Insert, modify, and delete Web content dynamically using CSS and Javascript.
- Create transitions between elements within a Web page as well as between Web pages.
- Scale content in Web pages.

- Animate elements on a Web page.
- Define, enter, bind, format, display, and modify XML data within HTML.

ITS 221O Topics in System Development: Game Programming I (3)
3 hours lecture per week
Prerequisite(s): ITS 151 and ITS 221D with a grade of "C" or higher or consent of Business Education Department Chairperson or program coordinator, or instructor.

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.

Upon successful completion of ITS 221O, the student should be able to:

- Set up, configure, and make use of a software development environment on an industry-standard hardware platform (Windows, Playstation, GameBoy Advance, etc.).
- Describe historical and state-of-the-art techniques in a variety of software genres.
- Research and apply known solutions to software development issues.
- Produce a technical design from a functional specification.
- Implement memory management architectures.
- Implement media asset management systems.
- Create architectures to support complex interactions between software components.
- Create real-time image compositing systems based on industry standard SDKs (OpenGL, DirectX, etc.).
- Work with real-time user input.
- Implement, explain and discuss appropriate measures to address issues of performance and security.
- Analyze and debug programs to ensure correct results.
- Collaborate with peers in design, development and deployment of a mid-sized software application.
- Estimate and manage a production schedule.

ITS 221P Topics in System Development: Game Programming II (3)
3 hours lecture per week
Prerequisite(s): ITS 221O with a grade of "C" or higher or consent of the Business Education Department Chairperson, program coordinator or instructor.

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.

Upon successful completion of ITS 221P, the student should be able to:

- Explain 3D modeling issues.
- Explain 3D transformations using matrices.
- Explain animation systems.
- Implement media asset management systems.
- Implement world-view constraint systems.
- Use a third-party polygon renderer (OpenGL, Direct3D, etc.) to produce complex, real-time scenes.
- Create architectures to support complex interactions between 3D shapes.

ITS 221Q Topics in System Development: Advanced Database Programming with VB (3)
3 hours lecture per week
Prerequisite(s): ITS 151 or consent of Business Education Department Chairperson, program coordinator or instructor.

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.

Upon successful completion of ITS 221Q, the student should be able to:

- Describe the Client-Server Model and different client-server architectures.
- Describe the importance of multi-tier applications in business environments.
- Define and execute the stages of designing multi-tier applications (conceptual, logical, physical).

- Deploy a multi-tier application.
- Access data using technologies such as ADO, OLE DB and ODBC.
- Execute advanced database queries using SQL, stored procedures, triggers and views.
- Implement data validation, error-trapping and transactions.
- Generate reports.
- Implement, explain and discuss appropriate measures to address issues of performance and security.
- Analyze and debug programs to ensure correct results.
- Collaborate with peers in design, development and deployment of a multi-tier database application.

ITS 224 Help Desk Support Practices (3)
3 hours lecture per week
Prerequisite(s): ITS 144 or consent of the instructor or BE department chair.

ITS 224 Help Desk Support Practices introduces the Information Technology student to the key concepts and skills of Help Desk operation. Students will study what a Help Desk is, characteristics of its users, common problems, and tools. Students will learn about how a Help Desk fits into an organization's structure and mission. Students will learn about the protocol and processing of incidents, the different support levels and methods. Students will learn about knowledge, asset and security management and how important these are to an organization's integrity. Students will have opportunities to both study and practice Help Desk operations in a controlled setting.

Upon successful completion of ITS 224, the student should be able to:

- Manage a task
- Educate and train others
- Provide efficient and effective customer service
- Solve problems and troubleshoot by analyzing situations
- Manage a project
- Document problems and solutions
- Install and maintain hardware and software

ITS 227 Web Site Development (3)
3 hours lecture per week
Recommended Preparation: ITS 124; ITS 129; ITS 148.
Comment: ITS 227 was formerly ITS 157.

ITS 227 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 and subsequently explored by students.

Upon successful completion of ITS 227, the student should be able to:

- Discuss the history of the Internet.
- Define the Internet.
- Use the terminology of the Internet.
- Explain how the Internet works.
- Describe the e-commerce use of information technology
- Access the Internet through different protocols.
- Work with the operating systems to connect to the Internet.
- Navigate through various Internet resources to process e-mail, access information, and communicate with other networks
- Design, develop, and update World Wide Web pages.
- Disseminate information on the Internet
- Explain the social impact of the Internet.
- Describe current problems of the Internet.
- Assess the future potential of the Internet.

ITS 228 Visual Basic II (3)
3 hours lecture per week
Prerequisite(s): ITS 148 or consent of the instructor or BE department chair.
Comment: ITS 228 was formerly ITS 151.

ITS 228 is an advanced course in using the programming language Visual Basic .NET to provide viable computing solutions in a business environment. It is assumed that the student is familiar with Visual Basic .NET. Enhanced user

interfaces, especially those used in multi-form applications are covered. Also included in this course are the development and processing of XML documents. Object oriented programming concepts regarding inheritance are emphasized and realized through the creation of user defined derived classes that overload and override base classes. Database application development is also a component of this course.

Upon successful completion of ITS 228, the student should be able to:

- Use structured program design and methodologies
- Develop multiform applications
- Manage structures and files
- Develop object oriented programs
- Develop database programs.

ITS 229AD Database Administration II (3)
3 hours lecture per week
Prerequisite(s): ITS 149AD or consent of the instructor or BE department chair.

ITS 229AD advances students' knowledge of database administration. In this class, students will learn how to configure a database server for multilingual applications. They will practice various methods of recovering the database using RMAN and Flashback technology. Database performance monitoring tools will be covered, in addition to the steps to take to resolve common problems and improve performance. Students will also learn how to administer a database efficiently by using database technologies such as the Resource Manager, the Scheduler, Automatic Storage Management (ASM), and VLDB features. They will set up a secure database using Virtual Private Database, and learn how to efficiently move data from database to database.

Upon successful completion of ITS 229AD, the student should be able to:

- Use RMAN to create and manage backup sets and image copies.
- Recover the database to a previous point in time.
- Use Oracle Secure Backup to backup and recover a database.
- Use Oracle's Flashback technology to recover your database.
- Detect block corruptions and take appropriate measures to correct them.
- Use the various Database advisors and views to monitor and improve database performance.
- Control database resource usage with the Resource Manager.
- Simplify management tasks by using the Scheduler.
- Review database log files for diagnostic purposes.
- Customize language-dependent behavior for the database and individual sessions.
- Administer a VLDB.
- Implement a secure database.
- Transport data across platforms.

ITS 255 Advanced COBOL and Mainframe Applications (3)
3 hours lecture per week
Prerequisite(s): ITS 155.

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.

Upon successful completion of ITS 255, the student should be able to:

- Design, write and run advanced structured COBOL programs for business application problems including multiple level tables, subprograms and VSAM files.
- Analyze and debug complex COBOL programs and ensure accurate results.
- Use Job Control Language (JCL) to instruct a mainframe computer in the execution requirements of a COBOL job.
- Understand the fundamental concepts of a mainframe online system, including the design of screen layouts.
- Prepare programs for production runs in simulated real work environments where a system is expected to perform correctly the

first time it is run for production. The student will create his/her own test data and JCL to prepare a system which is ultimately tested by the instructor for validity.

ITS 293 Information Technology Program Internship (3)
1 hour lecture/8 hours practicum per week
Prerequisite(s): Consent of BE department chairperson, Info Tech program coordinator, or instructor.
Comment: ITS 293 is repeatable for a maximum of nine credits; however, only three credits can be applied towards the fulfillment of requirements for the AS degree in Information Technology.

ITS 293 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. It offers the opportunity to develop workplace soft skills as well as technical skills.

Upon successful completion of ITS 293, the student should be able to:

- Perform activities in a cooperative work environment involving such areas as routine tasks, problem or crisis situations, creative suggestions or initiatives, personal development, work attitudes, and other competencies as determined by the instructor and the employer.
- Analyze or describe the job assignment in relationship to principles, concepts or procedures covered in the field of study to demonstrate practical work place experience and relate that experience to the ITS course of study.
- Meet industry standards for the ITS course of study as evidenced by workplace ethics, behavior, team work and interpersonal relations.
- Identify the personal qualities, work habits, and attitudes that lead to professionalism in the work place.

INTERPRETING and TRANSLATION

IT 101 Introduction to Interpreting (2)
4 hours lecture per week for 8 weeks
Prerequisite(s): ENG 100; ASL 202 or equivalent, or instructor consent.
Comment: IT 101 is an 8-week course.

IT 101 is an introductory course focusing on the process of becoming an interpreter in educational and other settings. To explore interpreting as a viable career option, the basic principles and practices involved in interpreting are covered extensively. Historical and current issues, terminology, ethical considerations, the interpreter's roles and responsibilities, and the skills necessary to work in this field are also emphasized.

Upon successful completion of IT 101, the student should be able to:

- Explain the interpreter's roles and responsibilities in and out of the classroom.
- Describe relevant interpreting codes of ethics and discuss their underlying principles and how they affect an interpreter's decision-making.
- Analyze the evolution of the models of interpretation and the history of the ASL/English interpreting field.
- Describe current issues facing interpreters in educational settings and other venues.
- Discuss the possible challenges interpreters encounter in educational settings.
- Compare and contrast ASL/English interpreters and spoken language interpreters.
- Identify the settings where and the participants with whom interpreters work.
- Identify and analyze the skills and knowledge successful interpreters possess.
- Describe the process of becoming an interpreter, including national certification and state credentialing.
- Compare and contrast interpreting in educational, medical, community, and law-related settings.
- Compare and contrast how Deaf consumers and interpreters view interpreters, their roles and responsibilities.
- Analyze how different interpreters approach their work.
- Identify important organizations for interpreters and demonstrate knowledge of relevant terminology.

- Discuss the power and intercultural dynamics that are present in interpreting situations.
- Provide feedback and evaluations to classmates during small group activities.

IT 102 Interpreting Readiness Skills (2)
4 hours lecture per week for 8 weeks
Prerequisite(s): ENG 100; ASL 202 or equivalent, IT 101 or instructor consent.
Comment: IT 102 is an 8-week course.

IT 102 focuses on the foundational skills interpreters require that will enable them to identify the speaker's main point, details and reason for speaking, and hold that information in their memory along with the message so they can effectively convey it in English or ASL. This course provides the theoretical knowledge and the practical strategies interpreting students need to perform this series of tasks.

Upon successful completion of IT 102, the student should be able to:

- Describe and practice the Process Interpreting & Sociolinguistic Models.
- Identify and explain the possible types of text goals/intentions a speaker may use.
- Analyze a source language message for the speaker's goal and intention.
- Decode, represent, and organize source language information according to text type.
- Paraphrase accurately messages rendered in ASL and English.
- Shadow messages rendered in ASL and English on the lexical, phrasal, sentential and textual levels.
- Identify the main goal of various texts in English and ASL.
- Identify the supporting points of various texts in English and ASL.
- Predict the conclusion of a partially presented message.
- Perform cloze skills in English and ASL on the lexical, phrasal, sentential and textual levels.
- Analyze a variety of messages for gender, age and regional differences.
- Analyze ("Four-Fold") a message for the speaker's perspective, main points, details, and omitted information/perspectives.
- Demonstrate auditory and visual discrimination skills at 80-100% accuracy.
- Participate in various verbatim and semantic memory enhancement exercises.
- Demonstrate an improved score on speed reading comprehension checks.
- Compare and contrast ASL and English linguistic features on an introductory level.
- Provide structured feedback and evaluations to classmates during small group activities.

IT 111 ASL/English Comparative Linguistics (2)
4 hours lecture per week for eight weeks
Prerequisite(s): ENG 100; ASL 202 or equivalent; IT 102; or instructor's consent.
Recommended Preparation: LING 102.
Comment: IT 111 is an 8-week, modular course.

IT 111 compares the major linguistic features of American Sign Language and English. Basic similarities and differences in the morphology, phonology, syntax, and semantics of these two languages are examined. The course introduces students to how each language represents various communicative functions and to the process of analyzing those functions.

Upon successful completion of IT 111, the student should be able to:

- Describe the importance of comparative linguistics to interpreters.
- Compare and contrast basic phonology and morphology for ASL and English.
- Compare and contrast how ASL and English use nouns and verbs to organize events.
- Compare, contrast and demonstrate how ASL and English describe people, places, and things.
- Demonstrate pronominilization and role-shifting in ASL and English.
- Compare and contrast how ASL and English describe actions.
- Demonstrate various verb forms in ASL and English.
- Compare and contrast how each language asserts, negates, and questions.
- Demonstrate basic sentence types (assertions, negations, queries, conditionals, rhetoricals, etc.) with equivalent meanings in ASL and English.
- Demonstrate appropriate non-manual grammatical markers in ASL.
- Compare and contrast how ASL and English indicate spatial arrangements and proximities.
- Demonstrate various ASL classifiers (Body, Body-part, Instrument, Semantic, Locative, etc.).
- Compare, contrast and demonstrate how each language pluralizes.
- Demonstrate how topicalization is handled in ASL and English.

- Demonstrate the process of expansion and compression on an introductory level.
- Compare, contrast and demonstrate how metaphors, idioms and colloquialisms are handled in both languages.
- Compare and contrast how conversations and extended narratives are opened and closed in ASL and English (greetings, introductions, leave-taking, etc.).
- Participate in small group activities that utilize selected linguistic features in both languages.
- Provide structured feedback and evaluations to classmates during small group activities.
- Demonstrate expanded ASL and English vocabularies.

IT 112 ASL/English Translation Techniques (2)
4 hours lecture per week for eight weeks
Prerequisite(s): ENG 100; ASL 202 or equivalent; IT 111; or instructor's consent.
Comment: IT 112 is an 8-week, modular course.

IT 112 focuses on analyzing, processing, and translating various texts in American Sign Language and English without the immediate time constraints typically encountered while interpreting. Strategies for obtaining message equivalence between the two languages are discussed and practiced while using texts drawn from materials typically found in educational settings. Various translated works are examined to illustrate the differences in the organization of information in ASL and English.

Upon successful completion of IT 112, the student should be able to:

- Analyze source language texts for content, context, affect, and register.
- Analyze a source text for gender, age and regional differences.
- Compare and contrast ASL and English vocabulary, syntax, and other linguistic features during the translation process.
- Identify and explain the goals/intentions a source text has and how they affect a given translation.
- Demonstrate strategies for finding the equivalent message in the source and target languages.
- Incorporate the appropriate ASL and English linguistic and cultural features into translations.
- Discuss various language models and translations in both ASL and English.
- Produce transcriptions of texts translated into ASL.
- Produce translations of various texts in ASL and English.
- Demonstrate sight translation of selected English texts.
- Discuss the purpose of back translation and demonstrate its use.
- Identify and analyze aspects typically found in children's literature.
- Translate children's stories into ASL that can be incorporated into K-12 settings.
- Display a portfolio of various translated stories and texts.
- Participate in translation activities and produce individual and group translations.
- Provide structured feedback and evaluations to classmates during small group activities.
- Demonstrate expanded ASL and English vocabularies by 3-5 lexical items per week.

IT 200 ASL/English Consecutive Interpretation (4)
9 hours lecture per week for six weeks
Prerequisite(s): ENG 100; ASL 202 or equivalent; IT 112; or instructor's consent.
Comment: IT 200 is a 6-week, intensive course.

IT 200 builds on the knowledge and practices gained in IT 112, Translation Techniques and focuses on concepts related to consecutive interpretation. Various texts are examined and practiced to further illustrate the differences in the organization of information in American Sign Language and English. Strategies are practiced for obtaining message equivalence in the target language. Interpreting theory, team-interpreting practices, text analysis and feedback strategies are applied to situations which allow for sufficient processing time. Discussion about how and when these are applied in educational settings is included.

Upon successful completion of IT 200, the student should be able to:

- Analyze source language texts for content, context, affect, cultural considerations, and register using mind-mapping and other types of non-verbal representations.
- Compare and contrast ASL and English vocabulary, syntax and other linguistic features between the source and target languages.
- Demonstrate strategies for finding equivalent messages between the source and target languages.

- Shadow messages in ASL and English on lexical, phrasal, sentential and textual levels.
- Discuss various language models, translations and consecutive interpretations in both ASL and English.
- Practice the Process Interpreting Model in a consecutive mode.
- Diminish the amount of processing time needed to produce a successful consecutive interpretation.
- Apply the appropriate interpreting techniques (comprehension, representation, text analysis, discrimination, cloze, prediction, retrieval) required for consecutive interpretations.
- Discuss when consecutive interpretation is desirable and appropriate in educational and other settings.
- Discuss the "demands" evident in a situation and the "controls" that are available to the interpreter to produce an effective interpretation.
- Participate in individual and small group activities that require consecutive interpretation strategies.
- Provide structured feedback and evaluations to classmates during small group activities.
- Demonstrate expanded ASL and English vocabularies while working with materials drawn from K-12 classrooms.

IT 201 ASL/English Simultaneous Interpretation (2)
4 hours lecture per week for 8 weeks
Prerequisite(s): ENG 100; ASL 202 or equivalent; IT 200; or instructor's consent.
Comment: IT 201 is an 8-week, modular course.

IT 201 builds on the knowledge and practices gained in IT 200 and focuses on concepts related to simultaneous interpretation. This course introduces the theory, strategies and information necessary to interpret in a simultaneous mode. The depth of processing skills and processing speed needed to clearly produce an equivalent message from one language to another across a variety of registers and situations in this mode are developed through guided practice. Semantics, register, text analysis, process management, "demand control", team interpreting, and feedback strategies as they pertain to educational settings and other venues are discussed and practiced.

Upon successful completion of IT 201, the student should be able to:

- Analyze source language texts for content, context, vocabulary, syntax, affect, cultural considerations, and register.
- Demonstrate strategies for finding equivalent messages between the source and target languages.
- Demonstrate on an introductory level the ability to simultaneously interpret messages into the target language on lexical, phrasal, sentential and textual levels.
- Discuss various language models and their simultaneous interpretations in both ASL and English.
- Practice the Process Interpreting Model in a simultaneous mode.
- Diminish the amount of processing time needed to produce a successful consecutive interpretation.
- Apply the appropriate interpreting techniques (comprehension, representation, text analysis, discrimination, cloze, prediction, retrieval, expansion, compression, etc.) required for simultaneous interpretations.
- Discuss and demonstrate when simultaneous interpretation is desirable and appropriate in educational and other settings.
- Discuss the changes in the educational interpreter's role based on grade level.
- Discuss the "demands" evident in various situations and the "controls" that are available to the interpreter to produce an effective interpretation.
- Participate in individual and small group activities that require simultaneous interpretation strategies.
- Provide structured feedback and evaluations to classmates during small group activities.
- Demonstrate expanded ASL and English vocabularies while working with materials drawn from K-12 classrooms.

IT 202 ASL/English Simultaneous Interpretation II (2)
4 hours lecture per week for 8 weeks
Prerequisite(s): ENG 100; ASL 202 or equivalent; IT 201; or instructor's consent.
Comment: IT 202 is an 8-week, modular course.

IT 202 builds on the knowledge and practices gained in IT 201 and focuses on a deeper understanding of the concepts and techniques required for accurate simultaneous interpretations. The processing skills and processing speed needed to clearly produce an equivalent message from one language to another across a variety of registers, situations, and discourse (monologic /narrative, dialogic/interview, and group) in this mode are developed through guided practice. Semantics, register, text analysis, process

management, "demand control", team interpreting, and feedback strategies as they pertain to educational settings and other venues are discussed and practiced.

Upon successful completion of IT 202, the student should be able to:

- Analyze source language texts for content, context, vocabulary, syntax, affect, cultural considerations, and register.
- Demonstrate intermediate level strategies for finding equivalent messages between the source and target languages.
- Demonstrate the ability to simultaneously interpret messages into the target language on lexical, phrasal, sentential and textual levels.
- Discuss various interpreting models and their simultaneous interpretations in both ASL and English.
- Practice the Process Interpreting Model in a simultaneous mode.
- Apply the appropriate interpreting techniques (comprehension, representation, text analysis, discrimination, cloze, prediction, retrieval, expansion, compression, etc.) required for simultaneous interpretations.
- Interpret monologic/narrative, dialogic/ interview, and group discourse at a level appropriate for a second year student.
- Discuss and demonstrate situations in which simultaneous interpretation is desirable and appropriate in educational and other settings.
- Discuss the changes in the educational interpreter's role based on grade level and situation.
- Discuss the "demands" evident in situations and the "controls" that are available to the interpreter to produce an effective interpretation.
- Participate in individual and small group activities that require preparation, vocal control, sign articulation, simultaneous interpretation, and teaming strategies.
- Provide structured feedback and evaluations to classmates during small group activities.
- Demonstrate expanded ASL and English vocabularies while working with materials drawn from K-12 classrooms.

IT 211 Transliteration (2)
4 hours lecture per week for eight weeks
Prerequisite(s): ENG 100; ASL 202 or equivalent; IT 202; or instructor's consent.
Comment: IT 211 is an 8-week, modular course.

IT 211 focuses on developing the knowledge and skills to understand a source message or represent a target message that resembles English. Current theories about transliteration and contact language varieties are presented and transliteration strategies are developed through guided practice. Prepared and spontaneous texts from K-12 classrooms are used to reinforce the concepts presented in class. Information about the role of facial grammar, processing, finger-spelling, and mouth movements is discussed. Language policy issues and how these policies in public schools influence the choices interpreters/ transliteraters make are also covered.

Upon successful completion of IT 211, the student should be able to:

- Analyze source language texts for content, context, vocabulary, syntax, affect, cultural considerations, and register.
- Discuss how various Signed English systems influence transliteration.
- Demonstrate strategies for finding dynamic equivalency between the source and target messages.
- Transliterate messages consecutively or simultaneously into Signed English or spoken English on lexical, phrasal, and sentential levels for a minimum of 15 minutes.
- Compare and contrast transliterations executed by various models.
- Practice the Process Model as it applies to transliteration.
- Apply the appropriate techniques (comprehension, representation, text analysis, discrimination, cloze, prediction, retrieval, expansion, compression, etc.) required for successful consecutive and simultaneous transliterations.
- Transliterate monologic/narrative, dialogic/ interview, and group discourse with at least 75% accuracy on performance exams.
- Discuss and demonstrate when manual transliteration or transliteration is desirable and appropriate in educational and other settings.
- Discuss and demonstrate the role of facial grammar, lexical borrowings, finger-spelling, contact language, and mouth movements in transliterations.
- Discuss the changes in the educational interpreter's role based on a school's language policy, student's grade level and the educational situation.
- Discuss the "demands" evident in various situations and the "controls" that are available to the interpreter to produce an effective transliteration.
- Participate in individual and small group activities that require transliteration strategies.

- Provide structured feedback and evaluations to classmates during small group activities.
- Demonstrate an increase, by 3-5 lexical items per week, in Signed English and English vocabularies while working with materials drawn from K-12 classrooms.

IT 212 Interpreters at Work (2)
4 hours lecture per week for eight weeks
Prerequisite(s): ENG 100; ASL 202 or equivalent; IT 211; or instructor's consent.
Comment: IT 212 is an 8-week, modular course.

IT 212 builds on the knowledge and practices gained throughout the IT series and is a companion to the DEAF 294 Practicum course. Focus is on understanding the logistics involved in negotiating, booking, preparing for and completing an interpreting assignment. Content/context specific vocabulary, semantics, register, text analysis, process management, ethics, "demand-control" issues, team interpreting, and feedback are addressed through the use of live and mock monologic and dialogic discourse taken from educational and related settings.

Upon successful completion of IT 212, the student should be able to:

- Identify effective business practices for working interpreters.
- Identify the current business issues facing working interpreters.
- Negotiate, accept, prepare for, participate in and submit billing for an interpreting assignment.
- Develop a business card and billing form.
- Demonstrate the appropriate professional behavior, dress, and demeanor for various interpreting assignments.
- Identify resources, strategies and support mechanisms to remain active in the field.
- Successfully interpret monologic/narrative, dialogic/interview, and group discourse in school-related contexts that involve diverse consumers.
- Develop appropriate negotiation strategies for various interpreting assignments and settings.
- Consecutively or simultaneously interpret messages into the target language on lexical, phrasal, sentential and textual levels.
- Apply the appropriate techniques (comprehension, representation, text analysis, discrimination, cloze, prediction, retrieval, expansion, compression, etc.) required for consecutive or simultaneous interpretations and transliterations.
- Discuss the "demands", challenges, ethical issues, and logistics faced in various educational and related settings and the "controls", strategies, resources and solutions that are available to the interpreter to produce an effective interpretation or transliteration.
- Identify the educational interpreter's role and responsibility according to grade level and situation/assignment.
- Interpret or transliterate monologic/narrative, dialogic/ interview, and group discourse for a minimum of 20 minutes with 75% accuracy.
- Practice appropriate monitoring, feedback and teaming techniques.
- Participate in individual and small group activities that require preparation, vocal control, sign articulation, consecutive/ simultaneous interpretation, and teaming strategies.
- Provide structured feedback and evaluations to classmates during small group activities.
- Demonstrate ASL and English vocabularies for specific content areas and grade levels and expand vocabulary by 5 lexical items weekly.

IT 294 Interpreting Practicum (3)
8 hours lecture, 150 hours practicum experience
Prerequisite(s): DEAF 201; IT 202; or instructor's consent.
Corequisite(s): IT 211 and IT 212; or instructor's consent.
Comment: Before enrolling in IT 294, students should obtain fingerprint and TB test clearance as required by the schools.

IT 294 provides students with an overview of interpreting in academic and related settings and provides an opportunity to work directly with students and faculty. Practicum students will be encouraged to participate in as much "hands-on" experience as is appropriate to the particular situation. After initial observation, the students will interpret with the on-site interpreter in a variety of classes and activities; provide support and work with individuals, and small and large groups.

Upon successful completion of IT 294, the student should be able to:

- Interpret instructional activities including

tutoring with individual students or small groups, with a mentor's direction and supervision.
- Accept mentor's and on-site interpreter's (if appropriate) guidance and feedback during practicum assignment.
- Apply principles of process interpreting, effective decision-making and teaming strategies while interpreting.
- Interpret clearly in ASL, Contact Varieties of English and English.
- Demonstrate appropriate behavior according to the setting, classroom activities and needs of the participants.
- Interact effectively with students, staff, and parents (when appropriate).
- Demonstrate professional and ethical behaviors appropriate to the environment.
- Document practicum assignments, summarize and analyze experiences in Practicum Notebook.