IM 105
Introduction to Informatics

Bulletin Course Description:

IM 105 Introduction to Informatics Cr.1.

This is a required foundation course for all students interested in the study of Informatics leading to the fulfillment of requirements in the Minor or Certificate programs. The course will cover key topics relating to ethics and social issues regarding Informatics. The course will provide applications and discipline specific examples involving all of the current converging technologies utilized in Informatics. The material presented will explore the interdisciplinary nature of Informatics. This course will provide the program plan of study and describe the various courses so the student can make the decisions necessary for the elective options as well as the semesters in which the courses will be taken.

Course Pre-requisite:

CS 106 (or equivalent) preferred

Level of the Course:

This is the first course. It is a unique offering for the Minor in Informatics. The course will allow the student to explore the courses that will be taken to complete the minor and make a decision about seeking the degree. It is expected that a student would take this course in their first or second year of their major.

Course Overview:

This will be a required course for all students interested in the study of Informatics leading to the Minor or Certificate. The course will cover key topics such as ethics and social issues of Informatics. The course will also show the types of applications and discipline specific examples of Informatics. The course will also lay out the program of study and describe the various courses so a student can make the decisions as to the elective options as well as the years in which courses will be taken.

Student Learning Objectives/Outcomes:

1. Design an ethics of information plan including ownership of data for the major discipline.
2. Describe the process of turning data into information and then into knowledge which can lead to action.
3. Use information about the courses required and their content to make a decision as to pursuing the Minor in Informatics.
4. Grasp the meaning and implication of ethics of information and the social impacts of information.
IM 210
Problem Solving & Programming for Informatics

Bulletin Course Description:

IM 210 Problem Solving & Programming for Informatics I Cr.4.

An introduction to computer programming and problem solving at the level needed for the study of Informatics. Programming topics include data representation, expressions, control statements, subprograms, simple input/output, GUI development basics, and event-driven programming. Problem solving techniques include problem specification, pseudo-code, and stepwise refinement.

Course Pre-requisite:

P: MA 153 (recommended), CS 106 or equivalent, and IM 105 Introduction to Informatics.

Level of the Course:

This is the first required BASE course for the minor. It is expected to be taken in the second year of the student's major. The student will utilize basic math skills and basic computer literacy as the beginning for this course.

Course Overview:

This is an introductory programming course that will provide the student the basics of problem solving techniques needed in the study of Informatics. This is an approach to programming from the viewpoint of applications with limited emphasis on software engineering techniques. The knowledge gained allows the student to continue in the study of applied technology used in the other base courses required for the Minor in Informatics. This course will require a closed lab environment.

Student Learning Objectives/Outcomes:

1. Design and implement a basic graphical user interface for an interactive computer application.
2. Describe and apply arithmetic expressions, assignment statements, control statements, and I/O statements used in writing computer programs.
3. Write and use subprograms in a meaningful manner.
4. Develop and use computer software that combines/integrates all of the above techniques.
IM 220
Database Application for Informatics

Bulletin Course Description:

IM 220 Database Application for Informatics Cr. 3.

Theory and application of database systems from the viewpoint of Informatics. Topics include: data analysis and design, data storage, data querying, and data visualization. A special emphasis will be put on developing web-applications that allow for information gathering and graphical representation of information through the deployment of database technology.

Course Pre-requisite:

IM 210 Problem Solving & Programming for Informatics

Level of the Course:

IM 220 is the second required BASE course in the sequence of the six main courses for the Minor. It is expected to be taken in the second year of the student's major. This course will build upon some of the material from the IM 210 course. It will be an introductory course for Database.

Course Overview:

The course will explore the proper techniques for setting up database applications which is a key component for the student of Informatics. The technology needed for the use of a database will be covered. Then the proper approaches for gathering data into usable form will be studied which will lead to data analysis. Data analysis becomes the "bridge" to data information and the key for Informatics.

Student Learning Objectives/Outcomes:

1. Describe how meta-information can be collected and then encoded using an ER-Diagram and a relational database.
2. Demonstrate how information is stored and retrieved from a relational database system and how such information can be visualized.
3. Interact with a database system using embedded SQL code.
4. Access a database system through a web interface.
5. Complete a project that goes through the cycle of defining information requirements of a task, designing an ER-diagram and a relational database that represents these requirements, entering information in a commercial database system, and creating access to the database system through a web interface.
IM 230
Informatics Infrastructure

Bulletin Course Description:

IM 230 Informatics Infrastructure Cr. 3.

This course focuses on the fundamental informatics technologies and their use in the company, business, or organization. Topics include design and development of web and other applications, computer operating systems, distributed systems, data applications, data and information analysis, e-commerce, multimedia technology, social implication of informatics, current and emerging technologies.

Course Pre-requisite:

P: IM 210 Problem Solving & Programming for Informatics

Level of the Course:

IM 230 is the third required BASE course in the sequence of the six main courses for the Minor. It is expected to be taken in the second or third year of the student's major. This course will build upon some of the material from the IM 210 course. It will be an introductory course for the infrastructure concepts.

Course Overview:

This course will bring the various topics from the prior courses into focus of their use in the company, business, or organization. The proper interfaces of the various applied technologies will be explored and explained. Organization issues and uses of the applied technology will be covered as well as additional applied technologies needed for any project in Informatics.

Student Learning Objectives/Outcomes:

1. Describe the OS-distributed system application and e-commerce.
2. Design and develop a web-based application.
3. Describe the meaning and implication of Informatics in Society.
4. Evaluate web-based application designs.
5. Define Informatics and its infrastructure.
Bulletin Course Description:

IM 310 Problem Solving & Programming for Informatics II Cr.3.

A continuation of IM 210 for students interested in a deeper understanding of program development. New topics include arrays, file I/O, fundamentals of object-oriented programming, and development of user-defined classes, advanced GUI programming, graphics, and presentation of visual data. Reinforcement of problem solving techniques.

Course Pre-requisite:

P: IM 210. Problem Solving & Programming for Informatics I

Level of the Course:

This is one of the three ELECTIVE courses. One of them will be required for the completion of the minor. It is expected that this course will be taken in the third year of the student's major. It will build directly on all of the material from IM 210. It will bring to the student many of the advanced techniques in programming,

Course Overview:

This course is designed to allow the student to gain additional application experience in some of the programming expertise areas. The areas of advanced graphics and Graphical User Interface (GUI) will be of particular interest for improved presentation and visualization of data. Problems solving concepts will be at a higher level than those introduced in the first programming course (IM 210).

Student Learning Objectives/Outcomes:

1. Describe and define arrays.
2. Demonstrate how to input data from a file and write data to a file.
3. Describe and summarize the fundamentals of object-oriented programming.
4. Develop software that presents information graphically to users in an application area.
5. Develop software that requires the use of arrays and file I/O for the solution of a problem.
IM 330
Information Retrieval & Presentation

Bulletin Course Description:

IM 330 Information Retrieval & Presentation Cr.3.

An introduction to the basic concepts and techniques in information retrieval and visualization. Topics include information organization, access, and visualization, Web-based information retrieval, searching, and graphical presentations and interfaces. Students will study existing information retrieval and visualization systems.

Course Pre-requisite:

P: IM 210. Problem Solving & Programming for Informatics I

Level of the Course:

This is the fourth require BASE course for the minor. It is expected to be taken in the third year of the student's major. This will build on the material from IM 210. The course will be an introduction to all of the basic Web and graphic design issues.

Course Overview:

This course now brings the data to the user in applications. This will include advanced techniques for organizing data. The design considerations needed for the presentation of data are covered and practiced. Advanced techniques such as information visualization and multi-media use will also be explored. Graphics programming will be covered and applied for data presentation.

Student Learning Objectives/Outcomes:

1. Demonstrate the presentation of data through visual representation.
2. Describe the concepts and principles of information retrieval systems.
3. Use the principles and techniques involved in information visualization.
4. Demonstrate knowledge about computer graphics required for visualization.
5. Explain the current trends in information retrieval systems and the role of information retrieval systems in new technologies.
Bulletin Course Description:

IM 370 Network Design and Management for Informatics Cr.3.

The design, implementation, and management of computer networks for informatics. Topics include telecommunication concepts, client-server environments, Internet and intranet, wireless systems, network devices, network operating systems, network design, implementation and management, and network security. Students are expected to design and implement small networks.

Course Pre-requisite:

P: IM 230. Informatics Infrastructure.

Level of the Course:

This is one of the three ELECTIVE courses. One of them will be required for the completion of the minor. It is expected that this course will be taken in the third year of the student's major. It will build directly on all of the material from IM 230. It will be an introductory course to the concepts in networking.

Course Overview:

This course will allow the student to explore man of the more advanced and even futuristic networking options. Gaining a working knowledge and understanding of the design and application of networks will be the outcome of the material covered. The student will be able to practice many of the techniques in applications that are particularly suited to use in Informatics.

Student Learning Objectives/Outcomes:

1. Describe/contrast/associate the meanings of Telecom, Internet, Client-server, Wireless system, and Network OS.
2. Design, implement, and manage a small computer network.
3. Present a network design solution to a given problem.
4. Evaluate, using rubrics, the design and implementation of a network.
IM 380
HCI Design for Informatics

Bulletin Course Description:

IM 380 HCI Design for Informatics Cr.3.

A survey of human-computer interaction concepts, methods, and evaluation. Topics include HCI design issues, Web design, user interface design and techniques, multimedia, and simulated environments. Students are expected to design, implement, and evaluate user interface designs in small projects.

Course Pre-requisite:

P: IM 330. Information Retrieval and Presentation

Level of the Course:

This is one of the three ELECTIVE courses. One of them will be required for the completion of the minor. It is expected that this course will be taken in the third year of the student's major. It will build directly on all of the material from IM 330. It will be an introductory course to the concepts of Human Computer Interaction.

Course Overview:

This course will bring the applications of the user interfacing with the computer to the forefront of use, application, and understanding. The student will design and implement various application oriented projects for depth of knowledge and a better understanding of how the human/computer interface is accomplished.

Student Learning Objectives/Outcomes:

1. Describe the foundation for user interface design, interaction styles, and assessment of user interface design.
2. Demonstrate through projects the actual techniques of human computer interaction.
3. Define what makes both good and bad user interface with a computer.
4. Identify the various components of human-computer interaction.
Bulletin Course Description:

IM 450 Informatics Design Project Cr.3.

This course will incorporate a discipline oriented project. The student will be involved in a project from the planning through the end product. Parts of the project will include the data design, gathering, manipulating, and analysis. The project will also consider Web interface and network considerations. Final graphics and visualization presentations (including multi-media if needed) will be the end product. Students will work in teams.

Course Pre-requisite:

P: IM 310 Problem Solving & Programming for informatics II, or IM 370 Network Design and Management for Informatics, or IM 380 HCI Design for Informatics.

Level of the Course:

This is the capstone project course for the sequence of six courses. All of the concepts, ideas, methods, and use of software will be encompassed in this course. The student should be at or near the senior level in their major discipline. This will allow the student to work in teams.

Course Overview:

This course will be a discipline oriented project if possible. The student will be involved in a project from beginning (conceptualization of the need for information) to end (graphical and visual presentation of results of investigation). Parts of the project will include the data gathering & data design, Web interface as needed, network considerations, analysis of the data for information, and then the final presentations for knowledge. Students will work in teams.

Student Learning Objectives/Outcomes:

1. Design a complete project plan that incorporates the major methods of Informatics.
2. Design the individual phases of the given project plan
3. Implement the individual phases utilizing the data gathered.
4. Integrate all of the individual phases to process the data and turn it into knowledge that is visually presented.
5. Verify that the knowledge will lead to conclusions and actions.