

# Information Technology (ITEC)

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## Information Technology (ITEC) Courses

### ITEC 1005 [0.5 credit]

#### Web Development

Introduction to Web development. Combining graphics, text, audio, and video to create Web sites; developing different, major working Web sites on an individual basis and in groups, using valid HTML5, cascading style sheets (CSS3), JavaScript and XML structures.

Precludes additional credit for IMD 1005.

Lectures and tutorials five hours a week.

### ITEC 1100 [0.5 credit]

#### Introduction to Interactive Media Design

Introduction to interactive multimedia and design, focused on the production and processes of animation, visual fx, game design and development, web design and development, and user experience/interfaces.

Topics include: mark-up languages, design process/problem-solving tools, human-centered design, product development, ethics, and copyright and intellectual property.

Precludes additional credit for IMD 1000.

Prerequisite(s): For students not enrolled in CSIT programs.

Lectures three hours a week.

### ITEC 1400 [0.5 credit]

#### Introduction to Programming and Problem Solving

Introduction to basic concepts of procedural programming and algorithm design in C. Topics include: basic variables, functions, operators, program control with iteration and conditionals, I/O operations, text and file processing, structures, arrays, pointers, debugging, algorithmic thinking and pseudocode, computer architecture, operating systems, and libraries.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1400, COMP 1005, COMP 1405, ITEC 1401.

Lectures/tutorials six hours a week.

### ITEC 1401 [0.5 credit]

#### Introduction to Scripting and Problem Solving

Introduction to basic concepts of object-oriented scripting and algorithm design in Python. Topics include: basic variables, functions, operators, program control with iteration and conditionals, I/O operations, text and file processing, arrays, tuples, lists, debugging, algorithms and pseudocode, computer architecture, operating systems, and libraries.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1400, COMP 1005, COMP 1405, ITEC 1400.

Lectures/tutorials six hours a week.

### ITEC 2000 [0.5 credit]

#### Multimedia Data Management

Issues involving the back-end organization of information focusing on databases and database design, server-side scripting, the structured query language (SQL), digital rights management, and watermarking.

Precludes additional credit for BIT 2008, IRM 2000 (no longer offered), IMD 2000 (no longer offered).

Prerequisite(s): BIT 1400 or ITEC 1400 or ITEC 1401 and IMD 1005 or IRM 1005 or ITEC 1005.

Lectures and tutorials five hours a week.

### ITEC 2100 [0.5 credit]

#### Data Visualization

Web-based data visualization techniques and systems. Good design practices for visualization, tools for visualization of data from a variety of fields, and programming of interactive web-based visualizations focusing on JavaScript, CSS, and related libraries.

Includes: Experiential Learning Activity

Also listed as IRM 2006.

Prerequisite(s): ITEC 1005 and ITEC 1400 or ITEC 1401.

Lectures/labs five hours a week.

### ITEC 2400 [0.5 credit]

#### Intermediate Programming

Introduction to object-oriented programming and algorithm design in C++. Topics include code and data encapsulation using classes and objects, inheritance, polymorphism, object-oriented design, data and code abstraction, program efficiency, user interface objects, event-driven systems, and an introduction to linked-lists and searching.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 2400, COMP 1006, COMP 1406, ITEC 2401.

Prerequisite(s): ITEC 1400.

Lectures three hours a week, tutorial three hours a week.

**ITEC 2401 [0.5 credit]****Intermediate Scripting**

Introduction to advanced object-oriented scripting and algorithm design in Python. Topics include class design and encapsulation, inheritance, polymorphism, object-oriented design, data and code abstraction, program efficiency, user interface objects, event-driven systems, and an introduction to linked-lists, sorting, and searching.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 2400, COMP 1006, COMP 1406, ITEC 2400.

Prerequisite(s): ITEC 1401.

Lectures/tutorials six hours a week.

**ITEC 3100 [0.5 credit]****Immersive Storytelling**

The craft of digital storytelling, creating compelling online and game-engine packages. Using a variety of narrative formats, interactive tools, and digital content, including blogs and RSS feeds, developing an in-depth story using leading edge technologies and techniques.

Includes: Experiential Learning Activity

Prerequisite(s): MPAD 2004 or CDDP 3003.

Workshop three hours a week.

**ITEC 4007 [0.5 credit]****Dynamics and Physics-Based Animation**

This course deals with the essentials of physics-based animations and dynamics; topics include basics of animation mechanics, collision detection, particle systems, and dynamic systems (cloth, fluid, and hair).

Includes: Experiential Learning Activity

Precludes additional credit for IMD 4007 (no longer offered).

Prerequisite(s): BIT 1100 and IMD 3002 or equivalent.

Lecture three hours a week, tutorial two hours a week.

**ITEC 4009 [0.5 credit]****Rigging and Advanced Character Animation**

This course covers the elements of rigging and advanced character animation; topics include the basics of forwards/inverse kinematics, controls, and weighting, essentials of human and creature rigging, retargeting, face and body motion capture, and motion studies for advanced keyframe animation.

Includes: Experiential Learning Activity

Prerequisite(s): IMD 3002 and IMD 3900 or equivalent.

Lectures three hours a week, tutorial two hours a week.

**ITEC 4010 [0.5 credit]****Visual Effects and Compositing**

This course covers the essentials of Visual FX and compositing, topics include camera setups (motion control systems), set issues, match-moving, image-based lighting, chroma-keying and object extraction, colour correction, 2D tracking, and rotoscoping.

Includes: Experiential Learning Activity

Prerequisite(s): IMD 3002 or equivalent.

Lecture three hours a week, tutorial two hours a week.

**ITEC 4011 [0.5 credit]****Artificial Intelligence for Digital Media**

This course covers the basics of artificial intelligence in games and animation, including behaviour and crowd systems (e.g. boids, reciprocal velocity obstacles, social forces, agent-based modelling, cellular automata), path finding and route planning, as well as procedural animation systems.

Includes: Experiential Learning Activity

Prerequisite(s): BIT 2400 or ITEC 2400 or ITEC 2401 or equivalent.

Lecture three hours a week, tutorial two hours a week.

**ITEC 4012 [0.5 credit]****Web Application Frameworks**

A detailed look at web application frameworks, focusing client and server-side frameworks that enable more advanced user interactions, including configuration, understanding functionality, and develop with them effectively.

Includes: Experiential Learning Activity

Prerequisite(s): IMD 1005 or ITEC 1005.

Lecture three hours a week, tutorial two hours a week.

**ITEC 4014 [0.5 credit]****User Experience Design and Accessibility**

User experience (UX) of interactive systems, including product and service design, usability and UX research. Emphasis on accessibility, with topics including creating accessible systems for users with a range of abilities, accessibility standards, and validation of designs in a practical context.

Includes: Experiential Learning Activity

Prerequisite(s): IMD 3004 or MPAD 1002.

Lecture three hours a week, tutorial two hours a week.

**ITEC 4015 [0.5 credit]****Designing and Producing Sound**

Introduces the concepts of digital audio & music specifically how it relates to digital media (games, film, mobile, etc). Topics include, digital audio recording, multitrack production and mixing, foley effects, signal processing for effect, time & spatial variations, and studio recording.

Includes: Experiential Learning Activity

Prerequisite(s): Third-year standing in any degree program.

Lecture three hours a week.

**ITEC 4016 [0.5 credit]****Virtual and Augmented Reality**

Design, development, and evaluation of virtual and augmented reality systems. Topics include VR/AR history, applications, hardware (display and input devices), software, interaction techniques for navigation, selection, manipulation, human factors, and empirical validation. Projects will use modern 3D game engines and VR/AR devices.

Includes: Experiential Learning Activity

Prerequisite(s): IMD 2006 or ITEC 3100.

Lecture three hours a week, tutorial two hours a week.

**ITEC 4017 [0.5 credit]****Photo and Non-Photo-Realistic Rendering**

This course deals with physically-based rendering methods and techniques in the global illumination field; topics include the rendering equation, ray and path tracing, radiosity rendering, photon mapping, final gather methods, materials and shaders, as well taking a look at non-photo-realistic rendering.

Includes: Experiential Learning Activity

Prerequisite(s): Third-year standing in any degree program.

Lecture three hours a week, tutorial two hours a week.

**ITEC 4018 [0.5 credit]****GPU Programming and Real-Time Rendering**

This course deals with the programming of the Graphics Processing Unit (GPU); topics include real-time rendering, shaders, and other advanced programming techniques that utilise single-instruction / multiple thread parallel processing units.

Includes: Experiential Learning Activity

Prerequisite(s): BIT 2400 or equivalent.

Lecture three hours a week, tutorial two hours a week.

**ITEC 4019 [0.5 credit]****Directing and Cinematography for Digital Storytelling**

This course covers the basics of being a director in a digital storytelling environment, including the basics of direction, dealing with actors, following scripts, and dealing with elements of cinematography; including lighting, cameras, shade, and shadow.

Includes: Experiential Learning Activity

Prerequisite(s): Third-year standing in any degree program.

Lecture three hours a week, tutorial two hours a week.

**ITEC 4020 [0.5 credit]****Environment and Architectural Modelling**

The course deals with the creation, development, and use of assets for digital environments; with specific focus on the workflows associated with scene construction and architectural modelling for a variety of real-time and non-real-time systems.

Includes: Experiential Learning Activity

Prerequisite(s): Third-year standing in any degree program.

Studio five hours a week.

**ITEC 4021 [0.5 credit]****Empirical Research Methods in HCI**

Advanced quantitative methods and conducting controlled user studies, statistically analyzing and reporting results in a research paper. Topics include history of empirical HCI, experiment design, hypothesis testing, interaction models, and scientific writing. Students complete a term-long research project.

Includes: Experiential Learning Activity

Prerequisite(s): IMD 3004 or 4th year standing in the BMPD program.

Also offered at the graduate level, with different requirements, as ITEC 5209, for which additional credit is precluded.

Lecture three hours a week.