

## CAREER STUDIES CERTIFICATE: MODELING AND SIMULATION

The Modeling and Simulation career studies certificate program is designed to provide students with the skills to create computer-generated representations of data that analysts can use in the planning and decision-making processes of a business organization. Graduates can be employed as modeling and simulation technicians, junior software engineers, software engineers, distributed simulation specialists, or simulation analysis assistants.

This advanced career studies certificate program requires a strong background in programming, computer operating systems, and mathematics.

<b>SEMESTER 1</b>			
<b>Course No.</b>	<b>Course Title</b>	<b>Credits</b>	<b>Prerequisite</b>
ITP 120	Java Programming I	4	ITP 100
<b>SEMESTER TOTAL</b>		<b>4</b>	
<b>SEMESTER 2</b>			
<b>Course No.</b>	<b>Course Title</b>	<b>Credits</b>	<b>Prerequisite(s)</b>
ITP 132	C++ Programming II (or ITP 220)	4	ITP 100
ITP 165	Gaming and Simulation	4	ITP 100 and ITP 120
<b>SEMESTER TOTAL</b>		<b>8</b>	
<b>SEMESTER 3</b>			
<b>Course No.</b>	<b>Course Title</b>	<b>Credits</b>	<b>Prerequisite</b>
ITP 260	Concepts of Simulation	4	ITP 165
<b>SEMESTER TOTAL</b>		<b>4</b>	
<b>SEMESTER 4</b>			
<b>Course No.</b>	<b>Course Title</b>	<b>Credits</b>	<b>Prerequisite</b>
ITP 265	Applications of Modeling and Simulation	4	ITP 265
<b>SEMESTER TOTAL</b>		<b>4</b>	
<b>TOTAL MINIMUM CREDITS</b>		<b>16</b>	

## Course Descriptions

### **ITP 120 - Java Programming I**

**4 credits**

Entails instruction in fundamentals of object-oriented programming using Java. Emphasizes program construction, algorithm development, coding, debugging, and documentation of console and graphical user interface applications. Prerequisite: ITP 100. Lecture 4 hours per week.

### **ITP 132 - C++ Programming I**

**4 credits**

Centers instruction in fundamentals of object-oriented programming and design using C++. Emphasizes program construction, algorithm development, coding, debugging, and documentation of C++ applications. Prerequisite: ITP 100. Lecture 4 hours per week.

### **ITP 165 Gaming and Simulation**

**4 credits**

Introduces students to the concepts and applications of gaming and simulation through the use of gaming and simulation tools, as well as through basic programming skills. Prerequisites: ITP 100 and ITP 120. Lecture 4 hours per week.

### **ITP 220 - Java Programming II**

**4 credits**

Imparts instruction in application of advanced object-oriented techniques to application development using Java. Emphasizes database connectivity, inner classes, collection classes, networking, and threads. Prerequisite: ITP 120. Lecture 4 hours per week.

### **ITP 260 Concepts of Simulation**

**4 credits**

Expands the application of discrete event simulation and introduces continuous simulation. Develops object-oriented simulation. Develops object-oriented programming techniques. Presents distributed modeling and simulation network communication protocols. Explores the practical applications of distributed simulation in industry. Prerequisite: ITP 165. Lecture 4 hours per week.

### **ITP 265 Applications of Modeling and Simulation**

**4 credits**

Expands understanding of Modeling and Simulation via the implementation of a capstone project. Continues to develop object-oriented programming skills. Expands three-dimensional visualization skills. Examines all aspects of the project lifecycle. Develops workplace readiness for the Modeling and Simulation industry. Prerequisite: ITP 265. Lecture 4 hours per week.