HOWARD PAYNE UNIVERSITY

THE SCHOOL OF SCIENCE & MATHEMATICS

COMPUTER INFORMATION SYSTEMS

OVERVIEW

The purpose of the School of Science and Mathematics is to provide programs and coursework to students in the fields of science, engineering, technology, and mathematics. The school also contributes course offerings for HPU's liberal arts and sciences general education curriculum. Undergraduate degrees are offered in the areas of biology, biomedical engineering, biomedical science, chemistry (with concentrations in biochemistry and forensic science), computer information systems, engineering science, information systems management, mathematics and software engineering.

COURSES DESCRIPTIONS

CIS 1070: The Integration of Faith and Technology

This seminar asks how a distinctly Christian worldview can impact technology usage and implementation. Through case studies and guided discussion, you will probe questions relating to ethics, stewardship of data, and vocational calling in tech fields. This course may be repeated as many times as needed. Students shall complete this course once per year during a regular semester for any calendar year in which the student takes a Rize Education course.

CIS 1101-4609: Special Studies

Special courses in computer information systems not a part of the regular schedule but offered on an irregular schedule.

CIS 1339: Introduction To Information Technology

An introductory course in computer information systems and computer literacy. The course covers topics of hardware, software, computer security, operating systems, basic networking systems and other current trends in technology. It is expected that students will focus in utilizing word processing, spreadsheets, and presentation software. Fall, Spring, Summer.

CIS 1360: Programming Fundamentals

An introduction to programming and developing logic concepts for structured programming. Importance is given to problem solving, Boolean logic, algorithm design, and documentation. Fall.

CIS 1381: Introduction To Cybersecurity

In today's world, no one is safe from cyber-attacks, but everyone can be prepared. This course will teach you how malicious actors use social manipulation and technology to launch devastating attacks - and provide you with the tools you'll need to defend against them. Whether you pursue one of the many available jobs in cybersecurity or just want to secure your own privacy, you'll learn how to make the Internet safer. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 2310: Applications In Excel

A study of advanced features of Microsoft Excel including those assessed in the Core MOUS exam. Students will expand their knowledge and develop spreadsheets that will address typical situations they would encounter in the real world. Fall, Spring odd years.

CIS 2311: Data Visualization

A study of techniques useful in organizing, cleaning, and analyzing business data for the purpose of answering questions and solving problems. Concepts introduced in the course aim to develop an understanding of different types of business data, various analytical approaches, and the application of those approaches to solve business problems. The course teaches techniques for accessing online data, utilizes technologies and applications to analyze data, generate insights, or make predictions, and to use visualization tools to represent data in compelling, interactive, and visual formats. Fall, even years.

CIS 2329: Web Programming I

This course introduces students to the many components of websites. Some of the topics covered will include: HTML, CSS, JavaScript, and server file systems. The student learns to design, construct and maintain webpages and websites. Fall, Odd years.

CIS 2341: Networking

An introduction to networking principles and design. The course covers the different networking layers, creating and administrating a network, and how applications communicate across a network. Spring.

CIS 2349: Web Programming II
Building on the front end of web design in CIS 2329 by learning server-side programming to create dynamic websites. Understand a connection to a database to pull date to populate the website. Spring, even years.

CIS 2369: Analysis Of Algorithms
Design of computer algorithms for numeric and nonnumeric problems; relation of data structures to algorithms; analysis of time and space requirements of algorithms, complexity and correctness of algorithms. Fall.

CIS 2370: Foundations Of Data Analytics I
In an increasingly data-driven world, everyone should be able to understand the numbers that govern our lives. Whether or not you want to work as a data analyst, being "data literate" will help you in your chosen field. In this course, you'll learn the core concepts of inference and data analysis by working with real data. By the end of the term, you'll be able to analyze large datasets and present your results. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 2371: Foundations Of Data Analytics II
This course is intended as a continuation of Foundations of Data Analytics I. In this course, you'll learn how Data Analytics are applied within the workforce. Particular attention will be paid to the role of the Data Scientist or Analyst, machine learning and the applications of Big Data. By the end of the term, you will be able to design and execute a range of data-driven experiments. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 2375: Career Navigation And Exploration In Data Science
This course will help you find a job in Data Science upon graduation. Not just any job; one that excites you and meets your financial needs. In this course, you will explore career paths in Data Science, potential salary outcomes, and the skills you need to understand whether these salary outcomes will support you. This

exploration will lead you to identify target jobs and opportunities. You will then plan the steps you need to take to achieve your goals and begin executing that plan. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 2381: Career Navigation and Exploration in Cybersecurity
This course will help you find a job in Cybersecurity upon graduation. Not just any job; one that excites you and meets your financial needs. In this course, you will explore career paths in Cybersecurity, potential salary outcomes, and the skills you need to understand whether these salary outcomes will support you. This exploration will lead you to identify target jobs and opportunities. You will then plan the steps you need to take to achieve your goals and begin executing that plan. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 2382: Network And System Security
Modern organizations know that even the strongest systems can be vulnerable to cyberattacks. As a result, jobs in cybersecurity are rapidly expanding as companies look to secure their digital assets. This course will teach you how to secure those assets by identifying and fixing potential security vulnerabilities. By the end of the course, you will be able to identify and remedy common network and systems vulnerabilities. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 2383: Cybercrime And Governance
This course is an introduction to data science in Python. Students will use advanced visualization and predictive modeling tools to turn raw data into actionable insights. Students will also learn how to use SQL to navigate databases. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students

to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 2389: Object-Oriented Programming
Covers the four pillars of object-oriented programming (abstraction, encapsulation, inheritance, and polymorphism) in a strict-typed language like Java. Students will build objects and programs to solve problems. UML diagrams, documentation, and version control systems will also be covered. Fall.

CIS 2399: 3D Printing
An introduction to digital modeling, drafting, sketching, and designing for 3D printing. Current modeling software, online services, and printing technologies will be examined. Students will identify, compare, and use multiple 3D modeling software. Spring.

CIS 3309: Object-Oriented Programming Ii
A study of the power and portability of current object-oriented languages from Microsoft and Oracle. Advanced object-oriented design and program development will be encouraged using exercises that range from lengthy programming assignments to major projects. Spring, odd years.

CIS 3319: Project Management
Use of project management techniques and software to manage business activities. Students will use the PMBOK guide as a framework for project management and extend their understanding via hands-on applications. Current project management software will be used to assist in project scope, time, cost, human resources, and communication management. The course may be used as a resource for preparation toward PMP certification. Fall.

CIS 3329: Visual Programming
A course designed to develop visual programming skills. The focus will be on programming in Microsoft's Visual BASIC and Oracle's Power Objects. Projects will explore the human- computer interface of interactive visual programming. Spring, even years.

CIS 3334: Fundamentals Of Layout And Design
A preliminary course for designing with the computer. A study of layout and design techniques including typography, copy fitting, picture editing, color reproduction and the production of camera-ready art. Emphasis will be given to the use of design elements in advertising, magazines and newspapers. Spring.

CIS 3338: Digital Image Manipulation
An introductory course that will cover the fundamentals of digital manipulation. Photo retouching, scanning, image capture, and image creation will be emphasized as well as coverage of layers, filters, masking, and channels. This class will culminate with the rendering of a professional portfolio component. Fall.

CIS 3339: Data Structures
Methods for organizing data; design of algorithms for efficient implementation and manipulation of data structure. Various data sorting and data searching techniques will be examined. Fall.

CIS 3369: Data Base Management Systems
A course concentrating on issues central to the design, implementation, and management of relational database systems. Topics include: Entity Relationship Modeling, SQL, rules, triggers, stored procedures, forms, reports, client/server development environment and integration with WWW. DBMS projects will incorporate current modeling and development software from Oracle and Microsoft. Spring, odd years.

CIS 3370: Data Science I
This course is an introduction to data science in Python. Students will use advanced visualization and predictive modeling tools to turn raw data into actionable insights. Students will also learn how to use SQL to navigate databases. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 3371: Data Science II
This course takes a deep dive into machine learning models, natural language processing, and time series in Python. Students will build machine learning models that solve a range of different business problems, using both structured and

unstructured data. Students will learn to create actionable and ethical predictions by balancing accuracy, usability, and interpretability, and bias in model selection, design, training, and inference. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 3379: Multimedia Technology

This course covers current interactive multimedia technology, aesthetics, and pedagogical issues of communication using interactive multimedia and hypermedia; techniques for authoring interactive multimedia projects using current digital media tools. Students apply principles and procedures of digital art, design, communication, and software authoring while working on integrated media projects. Spring, even years.

CIS 3381: Security Operations

The moments after a breach can make or break an organization. When the unthinkable happens and a cybercrime is discovered, the actions taken by the security operations team can either contain the damage and restore order or lead to catastrophic consequences. This course examines the tools and techniques used to conduct investigations into cybercrimes and teaches the defensive skills necessary to ensure a breach doesn't occur in the first place. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 3382: Ethical Hacking

To stop a hacker, you need to be able to think like a hacker. In this course, you will learn hands-on techniques for attacking and penetrating networks and systems. You'll learn the tools to launch these offensive tactics, and then complete a hands-on project where you will be asked to ethically hack a real system. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by

top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 3389: Management Information Systems
An introduction to the integration of information systems solutions and business processes. Topics include how information and information systems related to business processes; how organizations use IS for competitive strategy, and how IS are developed and managed. Ethical and international dimensions are also covered. Spring, even years.

CIS 4000: Texes Review Ffor Technology Applications Teachers
This course is designed to help students be successful when taking the Technology Applications Texas Examination of Educator Standards (TExES) exam.

CIS 4319: Digital Video Manipulation
This course includes the theory and application for developing videos using computer-based audio and video editing tools. Areas of study include the pre-production, production and post-production process of creating videos. Students will learn to import and manipulate digital audio, video, and graphic elements into computer applications to produce digital videos for use in a variety of media environments. This class will conclude with the creation of a video project that can be used as a professional portfolio component. Fall, odd years.

CIS 4321: Operating Systems
This course is designed to cover the general functions of an operating system, regardless of the hardware environment. Many specific operating systems will be examined: MS DOS, OS/2, Windows NT, UNIX, VAX/VMS, and IBM/MVS. Algorithms for CPU scheduling, memory and general resource allocation; process coordination and management will be covered. Fall. CIS 2348, CIS 2389, CIS 3309 or CIS 3329

CIS 4331: Computer Information Systems Internship
A course allowing individual study outside the academic environment, but under the guidance of the instructor. The purpose is to allow the advanced computer information systems student to obtain “real world” experience in the development and implementation of applications or systems programming projects. Openings at present are limited by the number of employment opportunities and projects that are available. May be repeated for maximum of 6 hours credit. Fall, Spring.

CIS 4339: Digital Illustration
Students will receive specialized training in the creation of computer-generated compositions through the use of a vector-based computer illustration application. Attention will be placed on corporate branding and logo design for the use in both print and screen print. This class will culminate with the rendering of a professional portfolio component. Spring, odd years.

CIS 4340: Artificial Intelligence
A study into the algorithms and structures that are used to build artificial intelligence. A combination of building known algorithms and exploration into novel AI solutions for problems. Spring, odd years.

CIS 4341: Network Design and Administration
An in-depth study of the concepts which govern network designs. The student will apply networking principles through simulations and guided hands- on work. This course is intended to prepare the student for CompTIA or Cisco certification. Fall, even years.

CIS 4348: Computer And Information Security
Principles, theory and practice of computer security and data protection. Topics will include the security aspects and implications of databases, telecommunication systems, and software, along with techniques used to assess risk and discover abuses of systems. Offered on demand.

CIS 4351: Systems Analysis And Design
A course concentrating on techniques and methods currently used in system analysis and design of information systems. Design methodology, project management, system design, program development, testing, documentation, and implementation techniques are covered and students are provided practical application through preparation for and participation in a short-term project involving an information system. Spring.

CIS 4370: Ai And Machine Learning
This course is a technical approach to cutting-edge AI methods. Students will productionize machine learning models to solve business problems, evaluate modern AI use cases (such as computer vision) and adapt Large Language Models (LLMs) for specific applications. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-

growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 4371: Data Science Practicum
This course is a capstone project in which students are asked to work through a full data science workflow using real-world data. This course exists to prepare students for the kind of work they will do on Data Science teams, and as such also features an emphasis on interviewing for jobs in the space and communicating results to stakeholders. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 4381: The Future Of Cybersecurity
Technology is racing forward, and cybersecurity must stay ahead to meet new challenges and threats. In this class, you will learn about the changing landscape of cybersecurity, emerging mobile technologies that are likely to be targeted, and new forms of cyber-attacks being launched. By the end of the course, you will be able to implement the most cutting-edge practices in cybersecurity in order to protect against attacks. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 4382: Cybersecurity Capstone
The Capstone course is the culmination of the Cybersecurity program, allowing students to apply their knowledge to real-world challenges. Students will undertake a comprehensive project integrating various aspects of cybersecurity, including log analysis, vulnerability assessment, incident response, ethical hacking, and cloud security. This project will develop critical thinking skills and prepare students for major cybersecurity certifications. This course is offered via HPU's partnership with Rize, an education company that prepares students for careers in the fastest-growing fields. The partnership allows students to earn HPU credit toward in-demand degree programs. Courses are designed by top academics and industry

leaders, vetted by HPU, and taught by expert faculty from other colleges and universities.

CIS 4390: Senior Project

A capstone course that culminates in a group project that incorporates the content from previous classes. The students complete a real-world project by developing a solution that fits a client's needs. This course should be taken the last spring semester before graduation. Spring. All prerequisites must carry a grade of "C" or better, or consent of instructor.