

ONLINE HU COURSES

Harrisburg University offers international high school and college students the option of enrolling online in HU's undergraduate courses listed below. Students applying for Tracks I, III and IV can learn Python Programming from HU by taking CISC 120 online. Students will receive 4 undergraduate credits, and a certificate.

Start Dates:

Spring 2019 (January)

Summer 2019

Fall 2019

CISC 120 Fundamentals of Computing

This course introduces the concepts and techniques of Python computer programming. Emphasis is placed on developing the student's ability to apply problem-solving strategies to design algorithms and to implement these algorithms in a modern, structured programming language. Topics include fundamental programming constructs, problem solving techniques, simple data structures, Object-Oriented Programming (OOP), program structure, data types and declarations, control statements, algorithm strategies and algorithm development.

CISC 160 Data Structures

This lecture and laboratory course further develops the concepts and techniques of computer programming. Emphasis is placed on structured programming, top-down design, more advanced data structures, and the proper use of the programming language and development tools. Topics include abstract data types (ADTs), sets, records, recursion, problem solving and algorithms, fundamental computing algorithms, searching, introductory sorting, hash tables, basic algorithm analysis, Object-Oriented Programming (OOP), files, linked lists, queues, stacks, and binary trees.

CISC 233 Essential Algorithms

This course covers the basic techniques used to analyze problems and algorithms, including asymptotic, upper/lower bounds, and best/average/worst case analysis. Amortized analysis, complexity, and basic techniques are used to design algorithms (including divide & conquer / greedy / dynamic programming / heuristics, choosing appropriate data structures) and important classical algorithms (including sorting, string, matrix, and graph algorithms). The goal is for the student to be able to apply all of the above to design solutions for real-world problems.

Fees: \$600 per course. Only one course can be taken in one semester.

Application: Please fill out the form and submit the fees by Dec 10th. <https://goo.gl/forms/Kgtjk8W3EKju2FWf1>

SUMMER @HU 2019

GLOBAL PRACTICUM IN EMERGING TECHNOLOGIES

The Harrisburg University of Science and Technology is accredited by the Middle States Commission on Higher Education, 3624 Market Street, Philadelphia, PA 19104. (267-284-5000) The Middle States Commission on Higher Education is an institutional accrediting agency recognized by the U.S. Secretary of Education and the Council for Higher Education Accreditation.

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SUMMER @HU 2019

GLOBAL PRACTICUM IN EMERGING TECHNOLOGIES

Harrisburg University of Science and Technology offers a program for international students in Global Practicum in Emerging Technologies in 2019. Practicums are field experiences that allow a student to observe and document how working professionals perform their job responsibilities. Students will also participate to a limited extent in performing tasks under supervision by program professors and on-site staff. Concurrently, students enroll in a course which outlines the expectations and requirements of the practicum.

At the end of the practicum students will have completed a project and acquire job ready skills in emerging technologies.

The programs will be offered in several cutting-edge topics.

Credits | 3 or 4 Credits

Cost | \$1700 for tuition and accommodation for four weeks. Airtare and food are not included, but the rooms are equipped with kitchenettes.

Dates | **May 13 - June 7**
June 17 - July 12

- Other dates available on request.
- All students in a group must arrive together at Philadelphia airport.
- Airport pickup and drop off is included – but only to this airport.
- Accommodations will commence on May 12 or June 16.

How to Apply | Please fill out a form at: <https://goo.gl/forms/eLGKgCCiqZQT5Gvt1>

Deadline for Application | February 15, 2019

Certificate | Students who complete a topic will receive a certificate.

Credits | 3 or 4 credits will be awarded on satisfactory completion of course.



SUMMER @HU 2019

GLOBAL PRACTICUM IN EMERGING TECHNOLOGIES

Harrisburg University's education programs focuses on individualized career advancement in high-growth and high-demand areas of study within science, technology, engineering, management, and mathematics disciplines. This is accomplished by making certain that each student is completely engaged to gain knowledge at an advanced level, is able to specialize or generalize knowledge and skills according to needs and interests, and applies what is learned and researched to both practical and professional experience.

The University's approach is based on an experiential model that allows the student to gain and apply knowledge and skills at an advanced level and to focus on an area of need or interest particular to the student. Faculty combine corporate and academic perspectives in the design, development, and delivery of graduate programs and courses. Each course has multiple applied projects, and each degree has a practicum requirement of all students.

This program will introduce students to different emerging technologies through hands-on and team-based projects. Students will select one of the following tracks:

I | Big Data Projects

Today the amount of machine-generated data is rapidly growing. Data is generated and shared when our "smart" home devices communicate with each other or with their home servers. The concept of Big Data is continuing to evolve but all agree that it is the driving force behind many ongoing waves of digital transformation, including artificial intelligence, data science and the Students will use their python coding skills and work on a project with real data from Google or a similar source. Data sets will be drawn from one of these areas: Agriculture, Smart Cities, Health.

Prerequisites: Students will have to pass a Python Programming Test. Material will be provided in advance so students can pick up the essential skills needed to pass this test.

II | Biosensors Biomedical Devices and Prototyping (May and June) Projects

Biomedical Devices is a US\$1Trillion industry with a 7% annual growth projection with devices diagnostic, prosthetic, and implantable devices. With commercialization of Point-of-Care devices for routine tests such as blood glucose monitoring, Lab-on-a-chip devices, Bioprinting, Telemedicine Apps for mobile devices etc. there is an increasing adoption of biosensors into the environmental, process industry, security, and biodefense application markets.

Students will learn about these cutting-edge topics, select a topic and build and test a biomedical device/biosensor device. If applicable, they will be allowed to work on a 3D printed prototype of their design. During the last week, students will present their work to an external panel of experts from the field.

Eligibility - All important concepts are covered during lectures. Qualified for students from any Life science discipline. Students with engineering background (Electronics, Electrical, Biomedical, Material, or Mechanical) are qualified as well. A Molecular Medicine primer can be made available as an online resource during Spring Semester for those who need it.

May 13 - June 7

Biosensors Project

Entrepreneurship

Interdisciplinary Science Research (Neurosciences)

June 17 - July 12

Artificial Intelligence Project

Big Data Project

Biosensors Project

Computer Engineering Project

Data Science Project

Entrepreneurship

Internet of Things (IoT) Project

III | Computer Science Projects in Artificial Intelligence or Computer Engineering

AI: AI is a constellation of technologies that allow smart machines to extend human capabilities by sensing, comprehending, acting and learning—thereby allowing people to achieve much more. These technologies include natural language processing, intelligent agents, computer vision, machine learning, expert systems, autonomous cars, chatbots and voice recognition.

Based on the explosive use of AI in all industry sectors, with highly publicized updates from Google, Amazon, IBM and others, any student planning for a technology career will benefit professionally from experience in this field.

Students will work on a project where they will design and implement real-world AI applications to interact intelligently with the surroundings.

Prerequisites: Students will have to pass a Python Programming Test. Material will be provided in advance so students can pick up the essential skills needed to pass this test.

Computer Engineering: Computer engineering is a discipline that integrates several fields of computer science and electronics engineering required to develop computer hardware and software. Computer engineers are involved in many hardware and software aspects of computing, from the design of individual microcontrollers, microprocessors, personal computers, and supercomputers, to circuit design. This field of engineering not only focuses on how computer systems themselves work, but also how they integrate into the larger picture.

Students will work with projects that will help them integrate concepts from different fields and applications in different industries.

Prerequisites: Students will have to pass a Python Programming Test. Material will be provided in advance so students can pick up the essential skills needed to pass this test.

IV | Data Science Projects

Data science is driving innovation in today's companies and the interdisciplinary skills of a data scientist are much in demand today. In this project, students will work on real datasets and learn the fundamentals of data science: from cleaning and visualizing data, to the application of cutting edge technologies for deriving and presenting data-driven insights to a panel.

Prerequisites: R programming Python Programming.

V | Entrepreneurship I and II (May and June)

Students from all disciplines are welcome to this program in entrepreneurship. Organized by Thinktomi University, a Harrisburg University partner, students will learn the elements of entrepreneurship, Silicon Valley style. They will work on a team project, create a business plan for this idea, perform the marketing research, work on a prototype and finally present a pitch to a panel of judges.

VI | Interdisciplinary Science Research (May)

Neurosciences are changing our lives from work on Alzheimer's disease to brain functions and cognitive science. In this intense project, students undertake a research project in one of the interdisciplinary sciences such as neuroscience. Students interested in other interdisciplinary sciences are also encouraged to apply. We will find and assign research mentors who will guide their research projects.

VII | Internet of Things (IoT) Projects

This is the concept of basically connecting any device to the Internet (and/or to each other). Gartner says that by 2020 there will be over 26 billion connected devices. The IoT is a giant network of connected "things" (which also includes people).

Students in this track will work with Raspberry Pi, embed sensors, collect data from these embedded sensors, analyze and present the data.

Prerequisites: Students will have to pass a Python Programming Test. Material will be provided in advance so students can pick up the essential skills needed to pass this test.



ELIGIBILITY

1. Students from all disciplines can apply.
2. All students applying for Tracks I and III, need to demonstrate competence in Python programming. For Track IV, students can demonstrate competency in R or Python. A test will be administered by HU faculty. Students not confident of their python programming skills can enroll in an online/blended learning course taught by HU in January 2019. See below.
3. Average grades should be 68% or 2.75/4
4. All students will need to demonstrate English language proficiency

GLOBAL PRACTICUM COURSE FORMAT

Students will learn about emerging technologies by participating in a hands-on internship project. They will work in teams on an industry aligned project with real world data and relevant deliverables.

Students will be guided by lectures and content, and tested through assignments and exams.

Students are expected to be on campus from 9 am to 4 pm every day, and should expect to work in the evenings on their projects and deliverables.

Minimum enrollment for any track is 10. Tracks where there are less than 10 enrollments could be canceled and registered students will be given an opportunity to pick a different track.

OUTSIDE OF THE CLASSROOM

The Global Practicum includes opportunities for field trips to businesses and companies in the area as well as sight seeing trips. In addition to the academics, we provide a great social opportunity for student to meet with students from other institutions, including Harrisburg University. We organize weekend events so that students can explore the city in an exciting but supervised manner.

RESIDENCE LIFE

Students will live on campus in apartment style residence halls. These residence halls are across the street from the HU campus building. 2-3 students will share one apartment.

Each apartment has a kitchen, cook top and fridge so students can cook their meals.

At the very beginning of the program we will take students shopping for groceries and other essentials.

SAFE. SECURE. SOCIAL.

Residence halls and the campus building are extremely safe. There is someone at the entrance 24 hours a day, and no one can enter the building without an ID. Residence Hall staff conduct bed checks every night to ensure that all students are back in their dorm room by a reasonable hour. Residence Hall directors are also responsible for organizing social events for the hall including outings to the amusement parks and baseball games.

Harrisburg is a small town, about 1 hour from Philadelphia and is considered extremely safe. The University is a respected employer in Harrisburg and students will be able to wander around town safely.

There are several restaurants close by including at least 2 Indian restaurants. HU is right next to a small mall with a food court where many students can shop and get something to eat.

VISITING FACULTY PARTICIPATION

Harrisburg University welcomes faculty chaperons and will provide accommodation for up to 7 days for one faculty chaperon per 10 students.

Please note that students enrolled in Summer@HU courses will be expected to spend their entire time on campus. Classrooms and labs will be strictly open only to enrolled students. Visitors, guests, parents and faculty chaperons are welcome to attend Orientation and the Certificate ceremony at the end of the program, and the classrooms and labs during the first week of the program. After that we request that visitors allow students to pursue their studies unaccompanied.