Human-Centered Design and Development, B.S.

Begin Campus: Abington, Altoona, Berks, Beaver, Brandywine, DuBois, Erie, Fayette, Greater Allegheny, Harrisburg, Hazleton, Lehigh Valley, Mont Alto, New Kensington, Shenango, Schuylkill, University Park, Wilkes-Barre, Scranton, York

End Campus: University Park

Program Description
The Human-Centered Design and Development major (HCDD) in the College of Information Sciences and Technology is a Bachelor of Science degree program that will educate students in the fundamental concepts and state-of-the-art skills in developing applications of technology for people, with a focus on learning outcomes needed to: a) identify opportunities to support human activity with technology; b) design and create useful and usable technology-mediated activities; and c) evaluate and iterate designed technologies in their context of use. Students graduating with a degree in HCDD will be positioned for successful careers in industry, government, and education, helping to ensure that our world of increasingly complex and pervasive technologies remains aligned with human aspirations, requirements, and limitations.

The HCDD major is interdisciplinary, combining foundational coursework in mathematics, statistics, information technology, and application development with specialized courses in social and psychological aspects of information technology use, usability engineering, user research methods, and user interface design. The major draws on courses already taught as part of the IST BS degree, but also includes new courses that expand the user-centered analysis and design concepts and methodological rigor needed to succeed as an HCDD professional.

Entrance to Major
To be eligible for the Human-Centered Design and Development (HCDD) major, students must:

1. Have completed the following entrance-to-major requirements with a grade of C or better in each: HCDD 113S or HCDD 113, IST 140 or (CMPSC 101 and IST 240) or CMPSC 121 or CMPSC 131, IST 210, IST 220, IST 242 or CMPSC 122 or CMPSC 132, STAT 200
2. Have achieved a minimum cumulative grade point average of 2.00 prior to and through the end of the semester during which the entrance to major is requested.

Degree Requirements
For the Bachelor of Science degree in Information Sciences and Technology, a minimum of 120 credits is required:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>45</td>
</tr>
<tr>
<td>Electives</td>
<td>6-12</td>
</tr>
<tr>
<td>Requirements for the Major</td>
<td>78-84</td>
</tr>
</tbody>
</table>

15 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 6 credits of GQ courses, 3 credits of GS courses, 6 credits of GWS courses.

General Education
Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (http://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required.)
- Quantification (GQ): 6 credits
- Writing and Speaking (GWS): 9 credits

Knowledge Domains
- Arts (GA): 6 credits
- Health and Wellness (GHW): 3 credits
- Humanities (GH): 6 credits
- Social and Behavioral Sciences (GS): 6 credits
- Natural Sciences (GN): 9 credits

Integrative Studies (may also complete a Knowledge Domain requirement)
- Inter-Domain or Approved Linked Courses: 6 credits

University Degree Requirements
First Year Engagement
All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement
6 credits are required and may satisfy other requirements
- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum
3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits
A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.
Quality of Work
Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition
The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80)). For more information, check the Suggested Academic Plan for your intended program.

Requirements for the Major

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IST 495</td>
<td>Internship</td>
<td>1</td>
</tr>
</tbody>
</table>

Prescribed Courses: Require a grade of C or better

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCDD 264</td>
<td>Design Practice in Human-Centered Design and Development</td>
<td>3</td>
</tr>
<tr>
<td>HCDD 340</td>
<td>Human-Centered Design for Mobile Computing</td>
<td>3</td>
</tr>
<tr>
<td>HCDD 364W</td>
<td>Methods for Studying Users</td>
<td>3</td>
</tr>
<tr>
<td>HCDD 440</td>
<td>Human-Centered Design and Development Capstone Course</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 15</td>
<td>Rhetoric and Composition</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 30</td>
<td>Honors Freshman Composition</td>
<td></td>
</tr>
<tr>
<td>ENGL 202C</td>
<td>Effective Writing: Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 202D</td>
<td>Effective Writing: Business Writing</td>
<td></td>
</tr>
<tr>
<td>PSYCH 100</td>
<td>Introductory Psychology</td>
<td>3</td>
</tr>
<tr>
<td>or SOC 3</td>
<td>Introductory Social Psychology</td>
<td></td>
</tr>
</tbody>
</table>

Select 12 credits from the Application Focus course listings. These are listings maintained by the department as support of major courses. At least one course must be at the 400 level. Students may also complete a custom Application Focus course sequence with approval from an academic advisor and an HCDD teaching faculty member. Students may want to consider choosing courses that also fulfill US and/or IL requirements.

Additional Courses: Require a grade of C or better

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>HCDD 113S</td>
<td>Foundations of Human-Centered Design and Development FYS</td>
<td>3</td>
</tr>
<tr>
<td>or HCDD 113</td>
<td>Foundations of Human-Centered Design and Development</td>
<td></td>
</tr>
<tr>
<td>IST 261</td>
<td>Application Development Design Studio I</td>
<td>3</td>
</tr>
<tr>
<td>or IST 361</td>
<td>Application Development Design Studio II</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 110</td>
<td>Techniques of Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 140</td>
<td>Calculus With Analytic Geometry I</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following: 3-6

- IST 140 | Introduction to Application Development                     |
- CMPSC 121 | Introduction to Programming Techniques                      |
- CMPSC 131 | Programming and Computation I: Fundamentals                  |
- CMPSC 101 & IST 240 | Introduction to Programming and Introduction to Computer Languages |

Select one of the following: 3-6

- IST 242 | Intermediate & Object-Oriented Application Development      |
- CMPSC 221 & CMPSC 122 | Object Oriented Programming with Web-Based Applications and Intermediate Programming |
- CMPSC 132 & CMPSC 221 | Programming and Computation II: Data Structures and Object Oriented Programming with Web-Based Applications |

Academic Advising

The objectives of the university’s academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy)

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https://ist.psu.edu/directory/office/grad_undergrad_studies