

Integrated Design (IDES) Courses

IDES1010 Introduction to 3D Design

This class is a hands-on introduction to designing in form and space. Students investigate form, perception and descriptive language across a variety of mediums. Students experiment with measurement techniques (manual and digital) and practice using projected drawing documentation.

Offered at Providence

3 Semester Credits

IDES1030 Direct Modeling

Direct modeling introduces students to Computer Aided Design (CAD). Students study the current landscape of CAD technologies and how different software tools match up with common design problems. The class then focuses on one common direct modeling software to teach the basics of 2D drafting, 3D modeling and output workflows.

Offered at Providence

3 Semester Credits

IDES2010 Human Factors

This class introduces the concepts of ergonomics, usability and user-focused design. Students study human performance including physical, psychological and behavioral capabilities and how our understanding of those capabilities determine aesthetics and standards in design practice. Students conduct primary and secondary research and use case studies to discuss how research can inform design process. A final project assessing and proposing a modification to an existing product allows students to apply their understanding of how user needs can drive design decision-making.

Offered at Providence

3 Semester Credits

IDES2020 Studio - Iteration

This course focuses on iteration and prototyping, the core of an investigative design process. Students experience a variety of prototyping techniques and learn of their application. Students develop a series of design proposals, using the critical ideation cycle: 1) Ideate, 2) Prototype and 3) Evaluate.

Offered at Providence

3 Semester Credits

IDES2030 Studio - User Centered Design

This course further develops the understanding of human factors in design and challenges students to practice the iterative approach to develop a series of design proposals that demonstrate user-centered design.

Prerequisite(s): IDES2010.

Offered at Providence

3 Semester Credits

IDES2040 Materials and Processes

This course develops a practical understanding of physical, digital and virtual materials and material conversion processes used in product development. Students investigate material properties through research, simulation and prototyping. Students use basic statics calculations to quantify material properties and make performance predictions. In short design projects, students incorporate their understanding of material properties and material conversion processes into their use of Computer Assisted Design tools.

Offered at Providence

3 Semester Credits

IDES2050 Parametric Modeling

Parametric modeling introduces students to Parametric Computer Aided Design (CAD). Students contextualize parametric CAD software within the current landscape of CAD technologies and how different types of parametric CAD (BIM, solid modeling, visual programming) apply to common design problems. The class then focuses on one common parametric modeling software to teach the basics of 2D drafting, 3D modeling and parametric workflows, focusing on the unique capabilities and efficiencies offered by parametric CAD.

Offered at Providence

3 Semester Credits

IDES2060 Studio - Form Finding

This course explores the relationships connecting form, aesthetics, human factors and material optimization. Methods of form finding are introduced through a series of design proposals. Each project emphasizes varying connections and priorities.

Offered at Providence

3 Semester Credits

IDES3010 System Design

This course introduces system thinking and system design techniques. Students practice interpreting, visualizing and analyzing products, organizations, and experiences as systems. Practices include diagramming, modeling and simulating. Students examine products in both micro and macro systems.

Offered at Providence

3 Semester Credits

IDES3020 Studio - Systems of Production

In this course students work with materials and processes and incorporate system design. Students develop a series of design proposals, each associated with an existing production system and the associated material and process constraints.

Prerequisite(s): IDES2040.

Offered at Providence

3 Semester Credits

IDES3030 Simulation, Analysis and Optimization

This course expands on students' understanding of systems thinking and their ability to predict and optimize system performance. Specifically, students practice modeling systems using qualitative and quantitative representation. Students practice using basic statistical methods to quantify system performance and draw relationships between system input, system relationships and system output. Students explore modern simulation techniques to make predictions of complex or stochastic processes.

Prerequisite(s): IDES3010.

Offered at Providence

3 Semester Credits

IDES3040 Studio - Ethical Design

This course challenges students to expand their consideration of the impact of design beyond the end user and direct stakeholders. Projects require students to address the broader impacts of a design proposal, the responsibilities of a designer to society, how one navigates conflicting obligations, and how user needs are valued and prioritized.

Offered at Providence

3 Semester Credits

IDES3050 Emerging Design Technologies

This course is an opportunity for students to explore the cutting edge of CAD, CAM, RP, IoT and other technologies driving changes in the design industry. The course starts with a broad survey of current technologies and trends. Students then research particular areas of interest more deeply. Visits to local advanced design and manufacturing businesses offer opportunities to see emerging technology in practice. Students concentrate on a particular technology and apply it to a short-cycle design problem.

Prerequisite(s): IDES1030, IDES2050.

Offered at Providence

3 Semester Credits

IDES3100 Parametric Engineering Design

This course explores the relationship between 2D representational drawings and 3D virtual and physical objects. Multi-view representation standards and techniques are presented and implemented through practice of traditional hand drawing. Parametric modeling software is employed to create virtual parts and assemblies from these drawings. Open-ended design problems are accomplished by utilizing multiple materials and methods of rapid prototyping, including laser cutting and 3D printing.

Offered at Providence

3 Semester Credits

IDES4010 Studio - Computational Design and Informatics

Through a series of design proposals, students practice using data-driven decision-making which may include generative design, simulation, and optimization. Additional computational design tools are introduced at the discretion of the instructor.

Prerequisite(s): IDES3030.

Offered at Providence

3 Semester Credits

IDES4020 Studio - Collaboration and Context

This course adapts the design process developed in prior studios to operate effectively on a variety of contextual collaborations. Each class works with external clients, requiring students to navigate complex relationships and communicate effectively with a variety of stakeholders. Students learn and practice current best practices for managing collaborative design processes. Students develop their ability to design in context by expanding their interpretation of human factors to include design for institutions, organizations and demographic groups. Students demonstrate global empathy by considering their project through an international lens.

Prerequisite(s): Completion of 12 credits of Integrated Design Studio courses.

Offered at Providence

3 Semester Credits

IDES4030 Preparation for Capstone Project

In preparation for the capstone project course, students develop and refine their own design perspective. Through researching areas of interest and practice composing questions to serve as the basis for further investigation, students develop and submit their capstone design project proposals for approval, prior to enrollment in the capstone project course. Students are encouraged to collaborate with an external sponsor in their self-directed capstone project which must be planned and incorporated into the design project proposal.

Prerequisite(s): Senior status.

Offered at Providence

1 Semester Credit

IDES4050 Capstone Project

This capstone design project embodies the individuated design process each student has developed and refined over the studio course sequence. Students build a project plan to meet the objectives of the course based upon their pre-approved proposals.

Prerequisite(s): IDES4030.

Offered at Providence

3 Semester Credits

IDES5030 Food Systems Design Methodology

This course integrates design thinking and systems thinking into a flexible methodology which students use to analyze and improve contemporary food systems. Students propose an intervention to solve or mitigate a systemic issue within a food system while considering the interactions between individual components and large-scale system dynamics.

Offered at Providence

3 Semester Credits