Integrated Design (IDES) Courses

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

IDES2005 Digital Modeling for Product Design
This course introduces students to computer-aided modeling as a core design skill. Students explore both direct and parametric modeling approaches to develop 3D forms, assemblies and prototypes for design exploration and fabrication. The course emphasizes digital workflows that connect modeling to additive and subtractive processes, including 3D printing, CNC milling and laser cutting. Students use digital modeling as a tool for iteration, visualization and presentation throughout the design process.
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

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

IDES2070 Innovation and Design I
This course introduces students to the essential skills and tools in modern design and fabrication. Emphasizing hands-on learning, students explore foundational techniques in material manipulation and iterative design. Throughout the course, students engage with a range of equipment, including 3D printers, laser cutters and a variety of hand tools. By understanding the capabilities and limitations of these machines, students develop an iterative approach to problem-solving, honing their skills in prototyping, design thinking and precision craftsmanship. Through projects, students practice the process of conceptualization, planning, fabrication and refinement, preparing them for advanced studies and practical applications in design and production.
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

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

IDES3060 Design Studio
Design Studios form the backbone of design thinking at JWU, enabling JWU students from any discipline to join diverse teams and solve open-ended design problems. Project teams are assembled by faculty around the skills and experience of the students, intermingling design majors and their expertise with the diverse skills and experience found among students from across Johnson & Wales. Students have the opportunity to enroll in the class up to five times, honing their problem-solving through scaffolded experiences of increasing complexity and responsibility. Experience 1: Iterating, testing and creating. Experience 2: Research, reporting and assessing. Experience 3: Drawing conclusions and making decisions. Experience 4–5: Defining the problem, planning and leading. Students work across teams on skills in iteration, user-centered design, ethics, computational design/form finding, and designing in collaboration and context. Design Studio projects vary each semester, arising out of ongoing research agendas within the department, inter-departmental collaborations, external sponsors, and student capstone projects.
Offered at Providence
3-6 Semester Credits

IDES3200 Innovation and Design II
This course explores the essential relationship between human-centered design principles and ethical decision-making in the field of design. Students examine how human factors, including ergonomics, usability and user-focused methodologies, guide the creation of products, systems and experiences that meet users' needs safely and effectively. In parallel, the course covers ethical frameworks and challenges in design, emphasizing responsible and inclusive design practices. Through case studies, discussions and hands-on projects, students gain practical skills in designing with empathy, sustainability and equity, learning to navigate the ethical complexities of the design process. By the end of the course, students are able to create designs that prioritize both usability and ethical considerations, preparing them to be conscientious designers in a diverse, global marketplace.
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