INDUSTRIAL DESIGN (IND)

IND 104 Fundamentals of Industrial & Interaction Design (3 Credits)
Design
Application of iterative design process in response to problem definition, production constraints and prototyping techniques. Discussion of social and environmental responsibilities within Industrial & Interaction Design professions.
Prereq: DES 101 and 103; Coreq: DES 102
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Scientific Inquiry and Research Skills (https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/)

IND 128 Design Worlds (3 Credits)
Design
This course provides a broad understanding of how design acts as a continuum between its traditional roots and how current design methodologies are being applied to emerging needs. Through a series of case studies and studio visits this course looks to challenge our understanding of the scope and impact of Design.
Coreq: DES 101 and DES 103 and WRT 105
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/)

IND 132 Industrial and Interaction Design Visualization Techniques I (3 Credits)
Design
This course introduces students to perspective drawing and sketching used by industrial and interaction designers. Ideation sketching, orthographic projection, one and two-point perspective, line value, lighting, surface value, and casting shadow techniques are covered.
Coreq: IND 104
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Communication Skills (https://coursecatalog.syracuse.edu/shared-competencies/communication-skills/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 200 Selected Topics (1-6 Credits)
Design
Exploration of a topic (to be determined) not covered by the standard curriculum but of interest to faculty and students in a particular semester. Repeatable

IND 201 Portfolio and Self Presentation I (1 Credit)
Design
Development of personal representation materials and skills needed in the application process for working in the design field.
Prereq: IND 104
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Communication Skills (https://coursecatalog.syracuse.edu/shared-competencies/communication-skills/)

IND 204 Industrial Design: Technical Graphics (3 Credits)
Design
True-scale perspective systems, orthographic projections, board skills, and presentation techniques.

IND 256 Digital Twin I (3 Credits)
Design
The use of three-dimensional (3D) solid modeling as visual communication. Design exploration and production tools as used to communicate intent to clients, modelers, engineers, and manufacturers.
Coreq: IND 271 and IND 273 and IND 275
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 264 Visualizing Design Research (3 Credits)
Design
Application of two-dimensional principles to effectively communicate complex facts visually. The meaning of a text as it relates to surface structures, objects, image juxtapositions, and formal relationships. Visualizing information from observational design research to support the narrative of a design concept in a formal design presentation.
Prereq: IND 104 Coreq: IND 275
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 270 Experience Credit (1-6 Credits)
Design
Participation in a discipline or subject related experience. Student must be evaluated by written or oral reports or an examination. Permission in advance with the consent of the department chairperson, instructor, and dean. Limited to those in good academic standing

IND 271 Sustainable Product Systems I (3 Credits)
Design
This course is an introduction to sustainable design solutions that consider the dual priorities of environmental and social responsibility. Students compare traditional and sustainable material and manufacturing processes. Students apply whole systems mapping and life cycle thinking to gain insights into the larger context of design solutions.
Advisory recommendation Coreq: IND 204
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 272 Principles of Industrial Design II (3 Credits)
Design
Basic design problems incorporating mechanical and electrical power systems, production constraints, and simple hand-to-product human-factor considerations.
Prereq: IND 271 and 204

IND 273 Prototyping (3 Credits)
Design
Concentrates on the development, understanding, and application of the design process. Solving design problems while considering internal component constraints and basic hand-to-product human-factor considerations. Developing a sketch into a three-dimensional entity through an iterative prototyping process.
Prereq: IND 104
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Civic and Global Responsibility (https://coursecatalog.syracuse.edu/shared-competencies/civic-and-global-responsibility/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/); Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Civic and Global Responsibility (https://coursecatalog.syracuse.edu/shared-competencies/civic-and-global-responsibility/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 274 Principles of Industrial Form II (3 Credits)
Design
Analysis and generation of additive, subtractive, and deformative curvilinear form as related to materials, tools, and machine processes.
Prereq: IND 271 and 204
Shared Competencies: Communication Skills (https://coursecatalog.syracuse.edu/shared-competencies/communication-skills/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 275 Qualitative Observation and Analysis (3 Credits)
Design
This studio course is an introduction to product solutions based on observational design methodologies and qualitative analysis that can be identified by understanding public events, artifacts, and historical reviews of consumer objects. Emphasis on identifying specific user needs through the study of real-time social phenomena.
Prereq: IND 104 and IND 128
Shared Competencies: Scientific Inquiry and Research Skills (https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/)

IND 276 Industrial Design: Visualization and Representation (3 Credits)
Design
Visualization, object representation, and presentation techniques examining the interaction between traditional drawing and technology as a means to communicate.
Prereq: IND 271 and 204
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 278 Designing Interaction (3 Credits)
Design
Development of time-based user experience interaction. Explorations of current paradigms for better understanding, greater productivity, and ease of use with adaptive interfaces.
Prereq: IND 104
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 280 Interntnational Course (1-12 Credits)
Design
Offered through SUAbroad by educational institution outside the United States. Student registers for the course at the foreign institution and is graded according to that institution's practice. SUAbroad works with the S.U. academic department to assign the appropriate course level, title, and grade for the student's transcript.
Repeatable

IND 290 Independent Study (1-6 Credits)
Design
Exploration of a problem, or problems, in depth. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor(s) and the department.
Repeatable

IND 300 Selected Topics (1-6 Credits)
Design
Exploration of a topic (to be determined) not covered by the standard curriculum but of interest to faculty and students in a particular semester.
Repeatable

IND 301 Portfolio and Self Presentation II (1 Credit)
Design
Development of personal representation materials and skills needed in the application process for working in the design field.
Prereq: IND 201
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/)

IND 337 Industrial and Interaction Design Visualization Techniques II (3 Credits)
Design
Visualization, object representation, and presentation techniques examining the interaction between traditional and contemporary drawing and technology as a means to communicate.
Prereq: IND 132
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 339 Semiotics: Messages and Interpretations (3 Credits)
Design
This course provides an introduction to semiotic communication and product semantics theories as they relate to industrial and interaction design. Structural and interactive representation will be explored in two, three and four-dimensional (time and behavior based) problem solving.
Coreq: IND 371 and IND 375
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 371 Sustainable Product Systems II (3 Credits)
Art & Design, Design
Students will learn about the economic-, environmental- and social-impact of their products. Life Cycle Assessment (LCA) process and analysis of the environmental impacts of design choices will be covered.
Coreq: IND 339 and IND 375
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/)

IND 373 Production Processes: Metals (3 Credits)
Design
Transforming metal into appropriate product forms by various mass production processes. Relationship of personal sensitivity to the logical formation of metal products.
Prereq: IND 272 and 274 and 276; Coreq: IND 375 and 377
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Civic and Global Responsibility (https://coursecatalog.syracuse.edu/shared-competencies/civic-and-global-responsibility/)

IND 374 Production Processes: Plastics (3 Credits)
Design
Transforming plastic material into appropriate product forms by various mass production processes. Relationship of personal sensitivity to logical formation of plastic products.
Prereq: IND 373 and 375; Coreq: IND 376

IND 375 Human Factors For Designers (3 Credits)
Design
Double-numbered with IND 673
Human factors, ergonomics, and anthropometric considerations in the human-product-environment relationship.
Prereq: IND 272 and 274 and 276; Coreq: IND 373 and 377
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/); Scientific Inquiry and Research Skills (https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/)

IND 376 Digital Surface Modeling (3 Credits)
Design
Double-numbered with IND 676
The use of three-dimensional surface modeling as visual communication. Design exploration and production tools as used to communicate intent to clients, modelers, engineers, and manufacturers.
Coreq: IND 374

IND 377 Industrial Design: Typography Studio (3 Credits)
Design
Application of two-dimensional principles to the generation of three-dimensional typographic projects. The meaning of a text as it relates to surface structures, objects, image juxtapositions, and formal relationships.
Prereq: IND 272 and 274 and 276; Coreq: IND 373 and 375
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/)

IND 379 Industrial Design: Primary and Secondary Research (3 Credits)
Design
Introduction to design based on insights into human behavior, culture, and environment. Students will observe and document interpersonal interaction, environments, and the products people use. Emphasis on identifying specific user needs.
Prereq: IND 373, 375 and 377; Coreq: IND 374 and 376

IND 380 International Course (1-12 Credits)
Design
Offered through SUAbroad by educational institution outside the United States. Student registers for the course at the foreign institution and is graded according to that institution's practice. SUAbroad works with the S.U. academic department to assign the appropriate course level, title, and grade for the student's transcript.
Repeatable

IND 392 Regenerative and Sustainable Materials for Design (3 Credits)
Design
Exploration of sustainability from the materials perspective. Students will study novel approaches to sustainable design through experimenting with biologically inspired materials, develop their own materials formulations, and assess them from perspectives of user experience, design viability, and manufacturability.
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Scientific Inquiry and Research Skills (https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/)

IND 396 Advanced Research Methods (3 Credits)
Design
This course builds on the introduction of primary design research skills by allowing students to explore design research methodologies at an intermediate to advanced level. Students will practice primary and secondary design research methods to inform strategic design criteria.
Prereq: IND 275
Shared Competencies: Scientific Inquiry and Research Skills (https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/)

IND 400 Selected Topics (1-6 Credits)
Design
Exploration of a topic (to be determined) not covered by the standard curriculum but of interest to faculty and students in a particular semester.
Repeatable

IND 401 Portfolio and Self Presentation III (1 Credit)
Design
Development of personal representation materials and skills needed in the application process for working in the design field.
Prereq: IND 301
Shared Competencies: Communication Skills (https://coursecatalog.syracuse.edu/shared-competencies/communication-skills/)

IND 447 Digital Twin II (3 Credits)
Design
The use of three-dimensional (3D) surface modeling as visual communication. Design exploration and production tools as used to communicate intent to clients, modelers, engineers, and manufacturers.
Prereq: IND 256 and IND 375
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 470 Experience Credit (1-6 Credits)
Design
Participation in a discipline or subject related experience. Student must be evaluated by written or oral reports or an examination. Permission in advance with the consent of the department chairperson, instructor, and dean. Limited to those in good academic standing.
Repeatable

IND 471 Digital and Physical Intersections (3 Credits)
Design
This course introduces students to explore digital and physical product intersections. The development of company-oriented, connected products for domestic, commercial, and industrial markets; Balance stakeholder needs. System level thinking.
Coreq: IND 447 and IND 475
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/)

IND 472 Industrial Design: Product Systems (3 Credits)
Design
Systematic analysis of human tasks and work sequences. Development of design criteria and specialized product environments and work stations. Problem definition and application of criteria to the design of complex products.
Prereq: IND 379 and 471 and 479; Coreq: IND 476

IND 475 Advanced Design Studio (3 Credits)
Design
The goal of this course is to pose a future-based design challenge developed to industry standards. Students engage in all phases of the development process to arrive at innovative solutions that draw from a wide array of skills developed within the IID major.
Prereq: DES 304 and IND 376
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/); Scientific Inquiry and Research Skills (https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/)

IND 476 Industrial Design: Environmental Practicum (3 Credits)
Design
Systematic analysis of human spatial and graphic environment. Space analysis and visual communication: exhibit design; industrial, commercial, and public spaces; and products.
Prereq: IND 471 and 477 and 479; Coreq: IND 472
Shared Competencies: Civic and Global Responsibility (https://coursecatalog.syracuse.edu/shared-competencies/civic-and-global-responsibility/); Ethics and Integrity (https://coursecatalog.syracuse.edu/shared-competencies/ethics-and-integrity/)

IND 478 Symbology and Semiotics in Industrial Design (3 Credits)
Design
Introduction to semiotic communication theories as they relate to industrial design. Structural representation will be explored in both two and three-dimensional problem solving.
Prereq: IND 374 and 376
Shared Competencies: Information Literacy and Technological Agility (https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/); Scientific Inquiry and Research Skills (https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/)

IND 479 Industrial Design Interface (3 Credits)
Design
Double-numbered with IND 679
Development of time-based interactions promoting expanding paradigms, better understanding, greater productivity, and ease of use through the use of adaptive interfaces. Additional work required of graduate students.
Prereq: IND 374 and 376 and 379; Coreq: IND 471

IND 480 International Course (1-12 Credits)
Design
Offered through SUAbroad by educational institution outside the United States. Student registers for the course at the foreign institution and is graded according to that institution's practice. SUAbroad works with the S.U. academic department to assign the appropriate course level, title, and grade for the student's transcript.
Repeatable

IND 481 Ethnography and Culture in Design (3 Credits)
Design
Project-oriented course introduces students to design solutions based on insights into people's natural behavior, culture, and environment. Requires field research into how people actually live, utilizing documentation and design research methods. Offered only in London for design majors.
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Scientific Inquiry and Research Skills (https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/)

IND 484 Capstone (3 Credits)
Design
Research, analysis, and solution of a major design problem selected by the student to further his or her professional career.
Prereq: DES 441 and IND 447and IND 471 and IND 475 Coreq: IND 492
Shared Competencies: Communication Skills (https://coursecatalog.syracuse.edu/shared-competencies/communication-skills/)

IND 490 Independent Study (1-6 Credits)
Design
Exploration of a problem, or problems, in depth. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor(s) and the department.
Repeatable

IND 492 CAD for Sustainable Mass Manufacture (3 Credits)
Design
Part and assembly modeling for manufacturing of plastic products and components. Consumer product mold design and injection molding simulation processes plus optimization for repair and maximized material recovery. Impact of manufacturing processes will be explored.
Prereq: IND 276 or MAE 284
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/)

IND 494 Biomimicry: Learning from Nature (3 Credits)
Design
This course is an introduction to biomimicry and its relationship to bio-inspired design. Students gain a deep understanding of life's principles and apply these principles to the design of spaces, products and services in an attempt to emulate closed loop systems.
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/); Scientific Inquiry and Research Skills (https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/)

IND 496 Design Philosophy & Ethics (3 Credits)
Design
This course examines the role of the designer in the context of a democratic nation and a global society. Throughout the semester we will grapple with the challenge of an uncertain future while developing individual design philosophies based on strongly held convictions.
Shared Competencies: Ethics and Integrity (https://coursecatalog.syracuse.edu/shared-competencies/ethics-and-integrity/)

IND 499 Honors Capstone Project (1-3 Credits)
Design
Completion of an Honors Capstone Project under the supervision of a faculty member.
Repeatable 3 times for 3 credits maximum

IND 500 Selected Topics (1-6 Credits)
Design
Exploration of a topic (to be determined) not covered by the standard curriculum but of interest to faculty and students in a particular semester.
Repeatable

IND 571 Industrial Design: Product Practicum (3 Credits)
Design
Developing company-oriented products for domestic, commercial, and industrial markets; associated packaging and displays. Balance between corporate and user needs: materials, production limitations, distribution, and marketing patterns.
Prereq: IND 471 and 477 and 479; Coreq: IND 573 and (IND 577 or 578)

IND 572 Industrial Design: Advanced Problems (3 Credits)
Design
Identification and solution of product problems based on industry-wide developments and societal needs. Appropriate and comprehensive solutions sought, developed, and communicated using professional-level techniques.
Prereq: IND 571 and 573 and (IND 577 or 578); Coreq: IND 574

IND 573 Industrial Design: Thesis Research (3 Credits)
Design
Comprehensive design document showing both critical and creative thinking. Both written and visual information are stressed in the final product.
Prereq: IND 471 and 477 and 479; Coreq: IND 571 and (IND 577 or 578)

IND 574 Industrial Design: Thesis (6 Credits)
Design
Research, analysis, and solution of a major design problem selected by the student to further his or her professional career.
Prereq: IND 571 and 573 and (IND 577 or 578); Coreq: IND 577

IND 577 Industrial Design: Philosophy and Ethics (3 Credits)
Design
Historical perspective. Contemporary position and responsibilities of the industrial designer in a technological/electronic society. Interplay with associated disciplines.

IND 578 Industrial Design: Professional Practices (3 Credits)
Design
Business organizations, design management and planning. Relations with clients, office organization and management; proposals and contracts, estimating, and elementary accounting. Protection of designs, patents, copyrights, and trademarks.

IND 580 International Course (1-12 Credits)
Design
Offered through SUAbroad by educational institution outside the United States. Student registers for the course at the foreign institution and is graded according to that institution's practice. SUAbroad works with the S.U. academic department to assign the appropriate course level, title, and grade for the student's transcript.
Repeatable

IND 590 Independent Study (1-6 Credits)
Design
Exploration of a problem, or problems, in depth. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor(s) and the department.
Repeatable