Department of Industrial Design

Be a Changemaker by DESIGN!





Metropolitan State University of Denver

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WELCOME LETTER FROM THE CHAIRPERSON



Welcome to the Industrial Design department at Metropolitan State University of Denver! Whether you are new to the field of Industrial Design, or if you have been looking forward to studying in this degree for a while now, we look forward to helping you achieve your goals to become a professional designer. As the only industrial design program in Colorado recognized by the National Association of Schools of Art and Design (NASAD), we strive to provide you with the best educational value possible. We have dedicated and experienced faculty and staff, and some of the best labs and facilities of any design program in the United States, all nestled at the base of our unique mountain-viewed metropolitan location at the urban center of Denver, Colorado.

Industrial design is a very competitive profession, but brings with it an immense amount of creative latitude and satisfaction. Our faculty continually improve our curriculum to provide you with the knowledge, skills, and practical experiences you need to be successful in the profession. However, you need to do your part and develop good work habits, consistently practice your skills, and foster your thirst for learning. We will give you important guidance, but you must put in the effort to become a true designer! Throughout this learning process, you will be joined in your journey by our diverse student body, technical resources, and local professional mentors.

Please contact our department for more information, including scheduling a tour to see our facilities, or to meet with some of our faculty. We endeavor to assist our students in the best way we possibly can, so let us know how we can help you get closer to becoming a Changemaker by DESIGN!

Sincerely,

Ted Shin Department Chair Professor



Faculty & Staff

Industrial Design students at MSU Denver can expect to learn from real world ID professionals and active design scholars via multi-cultural teaching techniques in which shared experiences lend to hands-on experiential learning. Our valued faculty and staff bring an assortment of professional expertise to the program and include: cultural design, prototype fabrication, composites manufacturing and applications, design research, marketing small business entrepreneurship, furniture and lighting design, bicycle design, outdoor soft goods, conceptual design, user experience design, human factors and usability design, 2D and 3D visualization, rapid prototyping, conventional and advanced materials and manufacturing process, and history of design...just to name a few.





"Ted" Jinseup Shin Department Chair Professor (303) 615-1156 jshin2@msudenver.edu

Professor Shin, received his MFA degree in Industrial Design from the University of Illinois at Urbana-Champaign and his BFA degree in Product Design from the Yeungnam University in Korea. Professor Shin worked for Samsung Electronics in Korea for seven years where he designed various products, including Samsung's first clamshell type cell phone that changed their entire production line. After receiving his MFA, Professor Shin taught several Industrial Design courses at Southern Illinois University Carbondale in Illinois for five years before joining MSU Denver. His interests are product-people interaction design, cultural design, new materials and technologies, and creativity. He is a member of IDSA and actively works with national and international companies as a professional design consultant.







David Klein Professor (303) 615-0695 kleind@msudenver.edu

Professor Klein, received his MFA degree in Industrial Design from the University of Illinois at Urbana Champaign, and his BA degree in Product Design from Southern Illinois University at Carbondale. He designed children's riding toys and adult fitness equipment at Roadmaster Corporation, decorative designs at David Marshall Inc., and consumer electronics for Samsung Corporation in Seoul, Korea. He completed a Fulbright-Hayes Seminar in the Czech and Slovak Republics, was a visiting scholar at the Beijing Academy of Science and Technology, and has presented at IDSA and NCIIA national conferences.





John Wanberg Professor

(303) 615-1281 jwanberg@msudenver.edu Professor Wanberg, received his BFA in Industrial Design from Brigham Young University with a minor in Japanese. His Industrial Design Masters of Science in Design is from Arizona State University, where he also taught Industrial Design courses for three years. Professor Wanberg enjoys mixing theoretical concepts of design with real-world, hands-on application and loves to explore the limits of design's capabilities. His expertise includes technology-based conceptualization, prototype fabrication, and composites manufacturing and applications. He is a member of the Society of Automotive Engineers (SAE) and has worked professionally in the design of alternative vehicles, as well as on a variety of products ranging from medical mobility devices and professional sound equipment to consumer goods.







Amy Kern Assistant Professor (303) 615-0679 akern@msudenver.edu

Professor Kern, received her Masters of Industrial Design from Pratt Institute in New York, her Bachelor of Arts in Religious Studies with an East Asian Emphasis from University of California, and has completed various international programs including Scandinavian Furniture Design from Danish School of Design in Copenhagen. Her extensive professional experience, specializing in furniture and lighting design, includes work with factories around the world, major corporate retailers, and custom design consultancies. Professor Kern is currently writing a book on Globalization and Craft Cultures.





Veronica Sanchez Jones Senior Program Manager

(303) 615-1103 vsanche8@msudenver.edu Veronica, received her Bachelor of Fine Arts degree in Writing & Directing for Film/Video from the University of Colorado of Denver and her Masters of Science degree in Human Resource Management from Colorado State University. Veronica has worked in higher education for 15+ years and, prior to joining MSU Denver's Industrial Design department, worked in the film and video production industry for a number of years.







Scott Mourer Lab Coordinator 303-615-1358 mourer@msudenver.edu





Evie graduated from CU Denver with a bachelor's degree in digital design and assists with all things related to classroom and lab.





Evie Weeden Lab Coordinator 303-615-06720 evweeden@msudenver.edu

Affiliate Professors

The Department of Industrial Design is fortunate to have Affiliate Professors who work professionally in the Industry. They have the hands on expertise to teach areas of specific concentration, and bring a competitive edge to our students, from Furniture Design to Design for Marketability, from Surface Modeling to Model Making, and much more.



Visiting Lecturers and Workshops

We are also fortunate to have distinguished visiting lecturers share their knowledge and work with our students as well as sponsored projects and workshops from some of the leading designers around the world!







Department Capabilities

The Department of Industrial Design at MSU Denver is located inside the Aerospace and Engineering Sciences Building (AES). We strive to prepare students for the professional world of industrial design through a well balanced design curriculum, including advanced manufacturing and hands on design skills. We are proud of our state of the art equipment and well-equipped laboratories, including our woods, metals, composites and plastics, and 3D printing lab facilities; all which lend to the student's experiential learning experience.

Senior Design Studio

Industrial Design students obtain their own work desk their senior year so they can begin to prepare for the environment of a professional career in Industrial Design.



FDM Rapid Prototypers

- Stratasys Dimension Elite
- Printrbot Simple
- Makerbot Replicator 2
- CubePro Trio
- Formlabs SLA
- ProJet 1200

Wood Fabrication Lab

- CNC Router 5'x8'
- Full line of high-end shop equipment
- Large spray booth







- Large Format Vacuum Forming
- Thermo Forming and general tool set up
- Mill
- Casting equipment

Professionally Staffed Open Lab Schedule

- Woods, Metals, Plastics
- Cintiq and Intuous Tablets
- Industrial Sewing Machines
- Wind Tunnel
- Equipped Photo Studio
- Computer Lab
- Textiles Lab

Metal Fabrication Lab

- CNC Plasma Cutter, Mill, and Laser Engraver (120 watt)
- Machining, Welding, and Sheet Metal Equipment
- In-house Powder Coating











ShopBot CNC Router



Epilog M2 Fusion Laser 120w



Ultimaker3 Printer



24" Wacom Drawing Tablet



AutoMetrix CNC Cutting Table



BossLaser 150w



Zortrax m200 3D Printer



Torchmate CNC Plasma



Stratasys Dimension Elite 3D Printer



Formlabs Form 2 SLA Printer



HP DesignJet t795 Plotter



Wind Tunnel



Student Designs

Students collect images of their design work and processes along their journey for their academic and professional portfolios. These are some of the current projects from our Industrial Design students at MSU Denver.





Designed by Janelle Vigil

Designed by Tim Bachman

Designed by Samantha Donen









Career Opportunities and Internships

Industrial Design students have the opportunity to apply for internships during their education to broaden their horizons. These are just some of the companies that our graduates work at that offer internships and career opportunities.





3D Systems - medical design for 3D modeling AHEC - mobile recycling station Autotron - design and manufacturing of automotive accessories Big Chill - home appliance design, assembly, marketing Boa Technology - design for technology and computers Black Sheep Bicycles- design and manufacture Boulder Outdoor Specialty Group - outdoor gear design and manufacture Case Logic, Inc.- design and manufacture of soft goods Complex Mechanical Design - engineering design Condit Exhibits - high-end exhibit design Cooper Lighting - design and manufacture Da Vinci Bicycles - design and manufacture Danaco Design - product design and prototyping Denver Art Museum **Denver Botanic Gardens** Denver Museum of Nature and Science Design Within Reach - Denver and Boulder **Designer Furniture Studios**

Distinctive Mantels- fireplace mantel design and fabrication Eco Products - design and manufacture for eco cutlery/dinner ware Eldorado Climbing Walls - design and fabrication Fentress Bradburn Architects - architectural models Fidlock - fastener manufacturer Goddard Enterprises - metal machining/fabrication Harrow Sports- design and manufacture of sporting goods Hexhead - full service product design JK concepts - wood product design and manufacture Karcher North America/Windsor Industries custodial equipment design and manufacture Kelty - outdoor gear design and manufacture Kiosk Information Systems - kiosk design Kirkland Museum Little Colorado - children's furniture and cabinetry design and manufacture Magpul Industries - design and manufacture for firearm industry Master Metal Works - design and fabrication MHM Gear - backpack design and manufacture Miles Ahead Inc.- event planning

ELECTRONICS

-MUSEUM











Monigle Associates Design - signage, corporate identity













childrer

Sлмsung

StudioWest

USEUM Denver Marsico Campus

Wood Logic - design and manufacture of storage products

York Space Systems - design and manufacture of spacecraft platforms Zeitgeist - furniture studio

Morris Manufacturing - wood fabrication Mountainsmith - outdoor gear design and manufacture MRK Cosmetics - cosmetic tools NOA Brands - mannequins and conceptual furniture design Omerica Organic - jewelry design and manufacture Optibike - electric bikes Orthopets - design and fabrication of adaptive equipment for pets Otterbox - consumer electronics accessories Panda Bicycles - design and manufacture Pride Mobility - wheelchair design and manufacture Protogenic, Inc. - rapid prototyping Real Flame- alcohol fuel fire place/pit design and manufacture Richman Furniture - design and manufacture Rimfire Management Corp. - product development Roche Bobois - furniture sales

Samsung Electronics - design and manufacture



Alumni Report

Industrial Design is an extremely global discipline and our graduates of the program are employed in a wide variety of design disciplines. The department periodically surveys alumni to determine what types of employment opportunities they received after graduation as well as their current status. Our most recent survey, conducted in June 2019, elicited 36 responses.



Alumni directly utilizing the skills and knowledge gained from their Industrial Design degree.



Alumni directly using their degree and are employed in Colorado.

Product Design and Development - 44%

Determine appropriate production processes, participate in design of new products, hand sketching, conduct site visits, concept drawings, design products, 3-D/Solid Works modeling, test products, research, redesign, project management, develop packaging and merchandising, conceptual design, prototyping and concept validation, mechanical design and documentation, technical drawings, create bills of materials, manage Chinese suppliers, recommend new processes and materials, define new products- coordinating their launch, gather market data on key fashion trends such as production, materials and color schemes, brainstorming sessions, design and engineer modifications to current designs for custom jobs, perform drawing updates, jig and fixture design, and manage drawing documentation.

Entrepreneurial Product Design - 18 %

Design, serve as CEO, put out fires, visit clients, supervise, design and manufacture products, manage all outbound marketing efforts, design, fabrication, installation, office manager, product sales, project management, CAD Design, pattern designer, product/material R&D, consulting with clients, design work and engineering, invention, product development, marketing, business functions, contracting, materials appropriation, design and management.

Computer Based Jobs/Drafting - 14 %

Design and document components and assemblies, use Solid Works, 3-D CAD design, use AutoDesk Land Desktop to produce construction level drawings, teach CAD, assemble, trouble-shoot, configure, test, and package various computer systems & platforms, assist Architects on architectural design utilizing 3D modeling software and CAD, create construction documents, perform construction administration and project management.

User Experience Design - 12 %

Consult with clients to define product specifications and explain research. Conduct user research and testing, develop strategies, usage scenarios, and task flows to enhance the user experience, collaborate with others to create intuitive, user-friendly solutions and interaction models and then evaluate their success.

Exhibit Design - 9 %

Design and develop new exhibits including cabinets, props for demonstrations, and puppets for children's area, create prototypes, research, design, fabricate, install, and maintain interactive museum exhibits, create presentation materials representing the recommended 3D product concepts, give technical supervision to in house art production department, manage outside graphics resources, work closely with engineering to provide cost effective solutions, planning, mocking-up, designing, and developing production specific components of high-end museum exhibits.

Model Making/Artisans/Non-computer Technicians - 3 %

Manage construction of architectural and topographical models, manage employees, bid jobs and create contracts, maintain inventory and equipment, master-plan, design and fabricate models, create and produce 3D forms using rapid prototyping machinery, use woodworking and metalworking skills in the crafting of furniture or artwork, design furniture and products, troubleshoot CAD problems, troubleshoot robotic problems, prepare architectural presentations, meet with owners and builders, design pieces with 3-D modeling software, perform wood shop operations, develop online marketing programs, configure end user hardware.

Industrial Designers Society of America (IDSA)

The Industrial Designer Society of America (IDSA) is the oldest and largest organization for industrial design students and professionals in the world. The organization is rapidly growing and has thousands of members in numerous student chapters, professional chapters and special interest sections in the U.S. and internationally. IDSA is the voice for the industrial design profession, advancing the quality and positive impact of good design.

The student chapter of IDSA at Metropolitan State University of Denver is led by students, for students with the hope of creating new professional opportunities, supplementing program curriculum and building strong community foundations. Student officers of IDSA frequently interact with professionals to plan events, gain sponsorships and enhance the education experience at Metropolitan State University of Denver.

MSU Denver is currently home to one of the country's most active IDSA student chapters. IDSA maintains a busy and exciting calendar throughout the semester. IDSA hosted events and programs include:

- Weekly workshops / talks / meetings
- Long weekend workshops with well known design experts
- Tutoring
- Student travel funding
- Professional design contracts
- Volunteering

Follow us at https://www.facebook.com/groups/iDSA.MSUdenver/ Metropolitan State University of Denver IDSA contact information: IDSA@msudenver.edu

Professional Resources:

Industrial Designers Society of America (IDSA) - www.idsa.org

IDSA's Women in Design - www.idsa.org/communities/sections/women-design

Core77 - www.core77.com

Coroflot - www.coroflot.com

Designboom - www.designboom.com





IDSA Faculty Advisor:

David Klein, Professor 303-615-0695 kleind@msudenver.edu







International Design Collaborative

The Industrial Design program at MSU Denver works to prepare our graduates to be workforce ready within the design industry through an experiential learning environment. Our program has a very strong and active relationship with universities around the world and have the opportunity to study abroad for a two week design workshop or a full academic year. This makes our students globally compenent because they learn the design cultures of other countries, broaden their global perspectives, and build international relationships.





PÉCSI TUDOMÁNYEGYETEM **UNIVERSITY OF PÉCS**



Fachhochschule Dortmund







IND Bachelor of Science degree requires 120 credit hours (No Minor Required)

To be awarded a degree, the student must complete the departmental requirements: 34 credits of General Studies, 73 credits of IND core requirements, and 13 credits of electives relevant to Industrial Design. Please see the Matrix, on page 23, for required courses and review the course descriptions for IND core requirements and electives. Students should consult with faculty advisors for selection and approval of a proposed plan of study.

IND Minor degree requires 22 credit hours

There is an increasing trend in business to value individuals who have education backgrounds in both business and a technical field such as Industrial Design. Therefore, the IND minor would be an excellent option for majors in the School of Business, Art, Technical Communications, and Engineering. Students should consult with an IND faculty advisor to register.

The IND minor courses include:

IND 1000 Introduction to Industrial Design IND 1100 Materials I IND 1300 Materials II IND 1450 Technical Drawing and CAD IND 1470 Design Drawing Techniques IND 2455 Industrial Design Studio for Non-Majors IND 2830 Manufacturing Materials and Processes IND 3950 History of Industrial Design

Departmental Requirements and Policies

In addition to meeting the course requirements for General Studies and the IND core, all IND students must:

• Meet with a faculty advisor each semester prior to registering for classes until IND 2450 (Beginning Industrial Design Studio), has been completed. Advising includes reviewing the student's degree progress report each semester. The *IND/Adv Portfolio* registration hold will be applied to a student's account each fall and spring semester and will remain there until they meet with their advisor.

• In accordance with NASAD requirements, and in order to maintain high quality standards, students must submit and pass the sophomore portfolio review after completing IND 2450 (Beginning Industrial Design Studio), and all prerequisite courses, in order to continue their studies in the department.

A full list of department and University policies can be found at https://www.msudenver.edu/industrial-design/academic-resources/.

Course Descriptions

IND 1000-1 Introduction to Industrial Design (1+0)

This course defines, describes, and explains opportunities in the field of Industrial Design. It identifies and allows for the discussion of career options, evaluates employment trends in the field, and reviews academic and professional requirements for entry into the field. Instruction and background in the use of the design process for Industrial Design is also provided.

IND 1010-3 Woods: Materials and Fabrication (1+4) (ART 1300) (Required for catalog years 2012-2020 only)

An introductory course designed to give students information about wood material properties, species selection criteria, practical design applications, and ordering and specifying protocol. The design process is presented and applied in the development of a furniture design and a fabrication plan, which is utilized to construct the design. The course also provides instruction for basic skill development in the use of woodworking tools, machines and processes. Wood finishing materials and processes are also studied and utilized in student projects. Credit will be granted for only one prefix: IND1010 or ART1300.

IND 1100-3 Materials I: Materials & Fabrication (1+4) (Required for catalog years 2021 to present only)

An introductory course designed to give students information about wood material properties, species selection criteria, practical design applications, and ordering and specifying protocol. The design process is presented and applied in the development of a furniture design and a fabrication plan, which is utilized to construct the design.

IND 1130-3 Plastics: Materials and Fabrication (1+4) (Required for catalog years 2012-2020 only)

This course is an introduction to the basic manufacturing processes and techniques used in the plastics industries. A variety of forming, casting, and reinforced plastic processes will be examined.

IND 1250-3 Metals: Materials and Fabrication (1+4) (Required for catalog years 2012-2020 only)

This course covers the manipulation of sheet metal, machining of metals, welding of metals, fasteners, and bench metal working. Finishing of metals is also covered, including mechanical processes, sandblasting, polishing, and painting techniques. Emphasis is placed on factors necessary to create products that involve metals and metal components. The design process is introduced and applied in the development of short-term design projects.

IND 1300-3 Materials II: Design & Application (1+4) (Required for catalog years 2021 to present only)

This studio and lecture course helps students apply advanced woods, metals, and plastics fabrication techniques to create original products. Students design and manufacture items in response to an assigned design brief through appropriate design considerations and material selection. The design process is documented throughout the semester to generate a detailed set of construction drawings and presentation materials.

IND 1450-3 Technical Drawing and CAD (1+4)

An introductory course designed to give students information about production drawings. The technical drawing process is presented and applied to a variety of products using both manual drafting tools and computer software. Additional topics include hand lettering, orthographic projections, dimensioning, Geometric Dimensioning and Tolerancing (GD &T), and creating Computer Numerical Controlled (CNC) data for part production. The design process is taught with the aid of a short term design project with accompanying technical drawings and CNC production.

IND 1470-3 Design Drawing Techniques (1+4)

This course introduces students to the basic concepts and skills used in industry to communicate ideas through a hand-drawn, two dimensional format. Students will develop drawing skills which represent objects as the eye sees them using perspective, shading, and a variety of graphic techniques. Instruction and practice incorporates the study of visual reality, graphic form, visual impact, and the logic and proof of what we see.

IND 2100-3 Digital Composition (1+4)

Prerequisite: IND 1000

This lecture/lab course prepares students to capture their original works digitally with various documenting equipment and to edit them with computer software. Studio and location photographic projects require students to use the camera for documentation, research and communication. Visual compositions that include digital and nondigital elements and presentation page layout principals will be introduced and practiced for students' department portfolio review preparation.

IND 2450-4 Beginning Industrial Design Studio (2+4)

Prerequisites: ART 1101, ART 1141 IND 1300, IND 1450, IND 2100, and IND 3050 Pre or Corequisite: ART 1501

In laboratory and studio environments, the design process is introduced and practiced as students apply learned fundamental skills, critical thinking, problem solving, and aesthetic refinement to assigned design projects. Students are required to address the historical context of their designs as they research technological evolution, market trends, aesthetic preferences, and consumer behavior. Students are required to document their work and create page layouts that depict and describe their projects according to the Department portfolio screening criteria.

IND 2455-3 Industrial Design Studio for Non- Majors (1+4) Prerequisites: IND 1300, IND 1450, IND 1470 Corequisites: IND 2830, IND 3950

This course is for non-majors. In laboratory and studio environments, the design process is introduced and practiced as students apply fundamental principles to three-dimensional forms, structures, and products. Students address the historical context of their designs as they practice critical thinking, research, problem solving, and aesthetic refinement. Students create sketches, drawings, models, research reports, and presentations of their design concepts.

IND 2810-3 Technology and Design: Global Perspectives (3+0)

ELECTIVE - Prerequisite: ENG 1010 Prerequisite or Co-requisite: ENG 1020

This course teaches students about the relationship between technology, design, and global cultures. Historical perspectives provide a foundation for discussion about how technology and design have affected, and continue to affect, the daily lives of people throughout the world. Emphasis is placed on relevant technologies developed in societies outside the U.S., and on the effects that those technologies have had on global societies, including the U.S. Particular attention is paid to communications, product design, food production, work and jobs, transportation, the military, sustainability, and ethical issues.

IND 2830-3 Manufacturing Materials and Processes (2+2)

This lecture course provides an overview of the mass-production manufacturing methods and materials most commonly utilized by industrial designers. It provides students with knowledge that will enable them to make appropriate material, manufacturing, and finishing selections for their own designed products.

IND 3000-3 Design Thinking (2+2) ELECTIVE

Design thinking methodology teaches a holistic approach of innovative way of solving problems. Multiple design projects will be utilized to help students develop creative thinking skills, to gain knowledge of design thinking, and to practice a wide range of innovative problemsolving methods for business and manufacturing applications.

IND 3050-3 Advanced Sketching (1+4)

REQUIRED (catalog years 2021 to present) ELECTIVE (catalog years 2012-2020 only) Prerequisite: IND 1470

In this course students will develop rapid visual communication skills through traditional sketching techniques and gain experience with various media. This course will develop students' abilities to quickly capture their design ideas by depicting 3D volumes on a 2D plane. Various rendering techniques in mixed media will also be explored to develop skill in representing color, texture, and material.

IND 3100-3 Composites: Materials and Fabrication (1+4)

ELECTIVE - Prerequisite: IND 1300

This course is a combination lecture/studio course that employs hands-on exercises and project fabrication to address various aspects for designing objects made of advanced composites, assessing the constraints of composites-related designs, and applying these topics through construction of a self-directed final project.

IND 3200-3 Bicycle Design and Fabrication (1+4)

ELECTIVE - Prerequisites: IND 1300, IND 1450, IND 1470

A lecture and laboratory course providing instruction in the history of the bicycle, requiring research into appropriate building materials for bicycles, and that will provide students an opportunity to design and fabricate a working prototype based on that research. The course will also provide instruction and practice of the basic metal fitting skills and subsidiary tooling required to fabricate a working bicycle prototype and selection of material appropriate finishes.

IND 3260-3 Direct Digital Manufacturing (2+2)

ELECTIVE - Prerequisite: MET 1210 or IND 3660 with a grade of "C" or better

In this combination lab lecture course, students explore the latest applications of digital 3D scanning and direct digital manufacturing. Through this course, students are introduced to current developments and the critical challenges of digital 3D technologies. Emphasis is placed on practical experience in utilizing departmental equipment to produce digital 3D tiles and output them to appropriate direct digital manufacturing equipment. Students will apply knowledge of 3D scanners for reverse engineering and direct digital manufacturing purposes.

IND 3330-3 Furniture Design (1+4)

ELECTIVE - Prerequisite: IND 1300

This lecture/lab course employs furniture fabrication projects to address the furniture design process, aesthetic design issues, structure, ergonomics, functionality, materials technology and manufacturability. Students utilize the design process to formulate concepts, communicate those design concepts, and fabricate a quality furniture piece based on their research and design solutions.

IND 3400-3 Product Usability and Ergonomics (2+2)

REQUIRED (catalog years 2021 to present)

ELECTIVE (catalog years 2012-2020 only - fulfills PSY 4410: Human Factors requirement)

This combination lecture and laboratory course stresses the importance of user interaction with products as a measure of product market viability and manufacturability. User interface components, anthropometries and psychologically intuitive design solutions for manufacture are addressed in the course.

IND 3450-4 Intermediate Industrial Design Studio (2+4)

Prerequisite: IND 2450

Students will produce functional, aesthetic designs for mass-market consumer products. Students will also learn and adapt the design developmental process used in industry. This includes finding and analyzing problems, conducting and documenting research, generating and proposing concepts, and presenting solutions in public. Projects emphasize materials, manufacturing methods, concept visualization, market relevance, and historical context.

IND 3480-3 Industrial Design Model Making (1+4)

Prerequisite: IND 1100, or permission of instructor

In a studio and laboratory environment, students will gain experience with a variety of model making techniques and materials. Students will learn to construct different levels of design models, from form study mockups in various scales to presentation-quality models. Students will also learn how to use them to evaluate and communicate product design concepts.

IND 3550-3 Textiles: Materials and Fabrication (1+4)

ELECTIVE- Prerequisites: IND 1450, IND 1470

In this course, students are provided with instruction in textile material characteristics, selection criteria, and appropriate textile design applications. The course will also provide an opportunity for basic skill development in fabrication techniques, including the use of sewing machines and pattern design.

IND 3600-3 Digital Visualization Techniques in ID (1+4)

Prerequisite: IND 2450

The objective of this studio course is to develop 2D digital concept visualization skills using computer programs and equipment. Instruction emphasizes professional level presentation techniques with various 2D computer programs, including vector and bitmap based programs.

IND 3660-3 Computer Aided Modeling (1+4)

Prerequisite: IND 1450

In a computer laboratory environment, students use software to model/render objects and designs in virtual three-dimensional space.

IND 3680-3 Computer Modeling for Manufacturing (1+4)

ELECTIVE - Prerequisite: IND 3660

This combination lecture and laboratory course serves as an advanced, computer-aided modeling course in sequence with IND 3660. The course focuses on the material and assembly testing tools within appropriate solid modeling software to create products for manufacture. Appropriate software for analysis of a product's readiness for manufacturing is also introduced. Emphasis is placed on developing models that facilitate direct digital manufacturing and advanced manufacturing methods.

IND 3700-3 Public Furniture Design (1+4)

ELECTIVE – Prerequisite: IND 2450

This is a combination lecture and laboratory course in which students investigate and apply the key considerations for the design of public furniture. Instruction will be provided in thepreparation of presentation materials for public use furniture competitions and furniture fabrication techniques. The application of these topics will be employed in the design and fabrication of a piece of furniture for public use.

IND 3800-4 Design for Marketability and Manufacturing (2+4)

Prerequisite: IND 3450

In this course, students gain knowledge of design for production criteria by developing a product and optimizing its design for specific mass manufacturing technologies. Students gain experience through the design development process, including market feasibility research, brainstorming new concepts, refining concepts, and constructing alpha and beta prototypes that are designed for mass manufacturing. Projects are based upon real-world, new product development principles. Students learn fundamentals of industrial production, ecological design, consumer safety and entrepreneurship.

IND 3950-3 History of Industrial Design (3+0)

This course provides an overview of the major personalities, organizations, styles, and evolutionary events that shaped the course of industrial design, from the Industrial Revolution to the present. There is a focus on the refinement of industrial design in Europe, the congruence of American design and industry, and the emergence of Asian design and manufacturing.

IND 3980-1-3 Elective Internship Experience (0+3 to 9)

ELECTIVE

Prerequisite: IN 2450

This internship is designed to allow students to acquire additional work experience in the design profession. The experience must be supervised by a design professional in conjunction with an Industrial Design faculty member. (Students may take this course twice for a total of 6 credits)

IND 4410-3 Surface Modeling for Industrial Design (1+4)

ELECTIVE - Prerequisite: IND 1450, IND 3660 or permission of instructor

This lecture/lab provides instruction upon the skill-set acquired in IND 1450 - Technical Drawing and CAD. Students will learn the principles of a NURBS (Non-uniform Rational BSpline) based 3D modeling and visual rendering program. The modeling program will be used to produce digitally generated, realistic, visual imagery to maximize the effectiveness of design presentations and the design decision-making process.

IND 4450-4 Advanced Industrial Design Studio (2+4)

Prerequisite: IND 3450

This course is a continuation of IND 3450, extending industrial design to user-centered research, conceptualization, and presentation. In this course, students learn advanced product conceptualization techniques, use additional product development tools, and produce professional quality product presentation materials. Special emphasis is given to human factors in product design.

IND 4460-4 Professional Industrial Design Studio (1+6)

Prerequisite: IND 4450

Students develop a semester-long design project under the guidance of a primary instructor and specialized mentor. Students compliment knowledge and skills from previous coursework with in-depth, qualitative research to create design solutions.

IND 4540-4 Concept and Portfolio Development (2+4)

Prerequisite: IND 4450

In this course, students develop futuristic 'blue sky' concepts that are based on new technologies and user-centered research. Students also develop a professional design portfolio of their best work. The portfolio showcases students' skills as aligned with program and student learning outcomes. Evaluation of portfolios provides data for ongoing assessment of the Industrial Design program.

IND 4550 Advanced Textiles: Soft Goods Design (1+4)

ELECTIVE - Prerequisite: IND 3550

In this course, students focus on the design and manufacturing of soft-goods products. All of the necessary information and artwork will be discussed in relation to its manufacturability. A final project portfolio will be included, but is not limited to, the following: research, sketches, orthographic drawings, explanatory views, renderings, color studies, and fabric/trim information.

IND 4860-2 Research in Industrial Technology (2+4)

ELECTIVE

This course provides in-depth research, laboratory experimentation, and/or development of a student-selected and faculty-approved topic in one technical system. The areas of research are: communications, manufacturing, and transportation/power. The course allows the student the opportunity to further develop problem-solving abilities. At the same time, the process enhances the student's knowledge and skills in a technical concentration.

IND 4960-3 Professional Internship (0+10)

Prerequisites: Completion of General Studies requirements; senior standing; and IND 4450.

The internship provides an opportunity for senior students to gain experience under the guidance of an industry professional. Students must complete a total of 150 hours during the semester in a placement relevant to the practice of Industrial Design. (Senior Experience)

Art Course Descriptions

ART 1101-3 Studio Foundations: 2D (0+6)

This course introduces the fundamental principles and elements of two-dimensional art and design through a survey of concepts, techniques, and material practices. Emphasis is placed on critical thinking and creative problem solving through investigations of compositional arrangement, visual perception, studio practice, and the intersections of form and concept in two dimensional space.

ART 1141-3 Drawing I: Black and White (0+6)

This course introduces drawing as the common denominator to all art-making media. Students practice fundamental drawing skills by employing a variety of black and white media and techniques through line, shape, value and texture. Course work emphasizes conceptual and technical abilities as well as visual perception and problem solving.

ARTH 1500-3 Art and Visual Literacy (3+0)

Prerequisite: ENG 1010 or ENG 1009 or permission of department

This course is a general introduction to the tools and methods used to analyze and interpret works of art in a variety of contexts. Students learn how to effectively communicate how visual forms work in conjunction with cultural beliefs both in the past and present. Analytical tools appropriate to the disciplines of art criticism and art history, including the use of research, are used by the student to support interpretations. A variety of artistic traditions, including materials and techniques from across the globe and throughout time, are introduced so that students are prepared to identify and interpret historical and contemporary examples of visual art and design. By developing an awareness of the relationship between visual forms and the messages they convey, students increase their ability to respond critically to their own increasingly complex, visual environment. This course is designed for the non-major and recommended for the General Studies requirement in Arts and Humanities.

ART 1501-3 Studio Foundations: 3D (0+6)

This course examines the fundamental principles of three-dimensional art and design through a survey of concepts, techniques, and material practices. Emphasis is placed on critical thinking and creative problem solving through investigations of physical form, process, context, and studio practices.

ARTH 1700-3 World Art II:Art 1400-1900 (3+0)

Prerequisite: ENG 1010 or ENG 1009, ARTH 1600, or permission of instructor Pre/Corequisite: ENG 1020 or ENG 1021 recommended

This course is an introduction to the discipline of art history and the tools used to analyze and interpret works of art within their cultural contexts. As the second part of a two-part survey, the course examines art, design and architecture from the 14th through the 19th centuries, paying particular attention to global cultural interactions and their impact on visual imagery. Analytical tools appropriate to the disciplines of art history, theory and criticism, including the use of research, are used by the student to support interpretations. This course provides the second of two foundation courses in art history for students in art, art history, and communication design majors and is recommended for non-majors to meet the General Studies requirements in Arts and Humanities and/or Global Diversity.



The 2023 - 2024 Academic Year Tuition and Fees



Get Started:

ADMISSIONS 303-556-3058 www.msudenver.edu/admissions askmetro@msudenver.edu

Costs and Deadlines:

OFFICE OF THE BURSAR Phone: 303-615-0070 Fax: 720-778-5809 Email: bursar@msudenver.edu

Mail Transcripts OR online:

OFFICE OF ADMISSIONS Metropolitan State University of Denver Campus Box 16, PO Box 173362 Denver, CO 80217-3362 https://www.msudenver.edu/registrar/transcripts

Estimated Cost of Tuition and Mandatory Fees Per Semester*

Credit Hours per Semester	12	9**	6	3
Resident Costs***	\$5,786	\$4,417	\$3,058	\$1,666
Non-Resident Costs	\$11,883	\$8,990	\$6,106	\$3,190

*Tuition and fees listed at msudenver.edu/bursar/tuitionandfees

**Health Insurance requirement applies to students taking 9 or more credit hours.

*** Note: Resident costs less with COF stipend

Federal Definition of a Credit Hour: To receive Title IV financial aid funds, all institutions of higher education must comply with the federal definition of a credit hour. The Higher Learning Commission requires institutions to maintain policies and procedures for verifying compliance with this definition. Federal Credit Hour Definition: A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than: (1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or (2) at least an equivalent amount of work as required in paragraph (1) of this definition for other activities as established by an institution, including laboratory work, internships, practical, studio work, and other academic work leading toward to the award of credit hours. 34CFR 600.2 (11/1/2010)

Financial Aid, Scholarships, and Awards

- To complete the FAFSA: https://studentaid.gov/h/apply-for-aid/fafsa
- To apply for scholarships and/ or see full listings: www.msudenver.edu/financial-aid/scholarships/
- Visit the Financial Aid Office in the Jordan Student Success Building, Suite 130 or call 303-556-8593

College and Department Awards:

IND Portfolio Excellence Scholarship

IND Outstanding Senior Student Award

College of Professional Studies Outstanding Student Award

IDSA Merit Award

Alumni Scholarship



College of Aerospace, Computing, Engineering, and Design

The department of Industrial Design at Metropolitan State University of Denver is part of the College of Aerospace, Computing, Engineering, and Design (CACED). CACED's primary objective is student success. Through excellence in learning, CACED prepares students for professional life and post-graduate degrees. CACED fosters an atmosphere of respect among students, staff and faculty. Graduates are culturally enriched as a result of our focus on inclusive excellence.

Access Center 303.615.0200 www.msudenver.edu/access/

Admissions 303-556-3058 www.msudenver.edu/admissions/

Bursar's Office Phone: 303-615-0070 www.msudenver.edu/bursar/ Career Services 303 615-1333 www.msudenver.edu/career/

Classroom to Career Hub 303-615-1333 www.msudenver.edu/classroom-to-career-hub/

Counseling Center 303-615-9988 www.msudenver.edu/counseling-center/ CHAS Advising Office 303-615-1100 www.msudenver.edu/health-applied-sciences/advising/

CACED Dean's Office 303.615.0026 www.msudenver.edu/aerospace-computing-engineering-design/ Financial Aid 303.556.8593 www.msudenver.edu/financial-aid/

Health Center of Auraria Campus 303.615.9999 https://healthcenter1.com/

IT Help Desk

303-352-7548

Orientation 303-615-0770 https://www.msudenver.edu/orientation-transition-retention/

Testing Center 303-615-1700

www.msudenver.edu/technology/www.msudenver.edu/testing/

LGBTQ Student Resources 303-615-0515 https://www.msudenver.edu/ lgbtq/

Transfer Student Services 303.556.3774 https://www.msudenver.edu/transfer-student/



www.msudenver.edu/industrial-design

Contact: 303-615-0599 | ind@msudenver.edu

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> Mailing Address: Campus Box 90, P.O. Box 173362 Denver, CO 80217-3362

