# Table of Contents

Welcome Letter ..........................................1
Faculty & Staff ............................................ 2
Facilities & Equipment ................................. 5
Our Program ................................................ 9
Student Work ..............................................10
Career Opportunities .................................13
Academic and Professional Partners ..........14
Curriculum ................................................ 18
Financial ....................................................24
Additional Resources .................................25
WELCOME LETTER FROM  
THE CHAIRMAN

It would be my pleasure to have the opportunity to visit with you concerning your interests in studying Industrial Design (ID) at The Metropolitan State University of Denver.

Our program offers a National Association of Schools of Art and Design (NASAD) accredited 4 year Bachelor of Science degree. The department is positioned to assist you in becoming a successful designer in the field of Industrial Design, with our dedicated, experienced and well-qualified faculty and high quality laboratories. The ID program is designed to provide you with the knowledge, skills, and practical experiences needed to be successful in the practice of Industrial Design.

The faculty, diverse student body, and metropolitan location of the University in the center of Denver can and will give you an advantage in the successful pursuit of a career in the design industry. We at MSU Denver look forward to being an active part of your future education and career plans. Please contact us with your questions.

Sincerely,

Ted Shin  
Department Chair
Faculty and 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, 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.

(303) 615-1156
jshin2@msudenver.edu

David Klein, Professor, 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.

(303) 615-0695
kleind@msudenver.edu
**John Wanberg, Professor,** received his BFA in Industrial Design from Brigham Young University with a minor in Japanese and his Industrial Design Masters of Science in Design 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, “mechano-aesthetic” design, 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 electronics and products, including aftermarket automotive equipment.

(303) 615-1281
jwanberg@msudenver.edu

---

**Amy Kern, Assistant Professor,** received her Masters of Industrial Design from Pratt Institute in New York, her BA 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.

(303) 615-0679
akern@msudenver.edu

---

**Veronica Sanchez Jones, Academic Dept Coordinator,** is the Academic Department Coordinator for the Industrial Design department at MSU Denver. She earned her BFA degree in Writing & Directing for Film/Video from the University of Colorado at Denver and her MS degree in Human Resource Management from Colorado State University. Veronica has worked in higher education for nearly ten years and prior to joining MSU Denver’s Industrial Design department, worked in the film and video production industry for a number of years.

(303) 615-1103
vsanche8@msudenver.edu
Terry Dreher, Lab Coordinator, is the Lab Coordinator for the Industrial Design department. He earned his B.S. in Industrial Design from Metro State University. Terry has worked for the Industrial Design department for eleven years. Prior to employment at Metro State he worked as an exhibit designer for the Children’s Museum of Denver. Terry is an avid outdoorsman and enjoys building furniture in his spare time.

(303) 615-0368
drehert@msudenver.edu

Will Kellogg, Lab Coordinator, earned a Bachelor of Science in Industrial Design from Philadelphia University and is alum of the Professional Internship Program at The Juilliard School, working in their prop shop. He worked in New York City Off-Broadway Theater for four years as a carpenter and special effects operator. He also co-founded Fez Empire, a modern media production company working with creative industries. Will offers his experience in prop and scenic design and construction, rapid prototyping and fabrication techniques, and multi media content and video creation.

303-615-0672
wkellog2@msudenver.edu
Creating next-generation manufacturing employees for Colorado

MSU Denver has embarked on an innovative project to integrate the study of advanced manufacturing disciplines into a single, new building. This facility revolutionizes advanced manufacturing education in Colorado by integrating the study of:

- Aviation and Aerospace Science
- Industrial Design
- Civil, Mechanical and Electrical Engineering Technology
- Computer Information Systems
- Computer Science

These disciplines collaborate in a state-of-the-art building, providing students with the curriculum, advanced technologies and the labs necessary to give them a highly experiential, relevant education.

See the new home of MSU Denver’s Industrial Design department on the southeast corner of 7th and Auraria Parkway on the Auraria Campus, which was completed Fall 2017.

With the Aerospace and Engineering Sciences Building, MSU Denver educates the most skilled, workforce-ready professionals available to meet the aviation, aerospace and advanced manufacturing needs of the state of Colorado.

AES Building Specs:

- Size: 142,000 gross square feet.
- Specialized laboratories: 62%
- Classrooms: 12%
- Support spaces: 13%
- Offices: 13%
- Break ground in fall 2015, open in 2017
Department Technical Capabilities

Industrial Design Department at MSU Denver strives 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.

The MSU Denver ID department strives to prepare students for the professional world of industrial design

- state of the art equipment
- well-equipped woods, metals, composites and plastics, and 3D printing lab facilities

Wood Fabrication Lab
- CNC Router 4’x4’
- CNC Router 5’x8’
- Full line of high-end shop equipment
- Large spray booth Metal Fabrication Lab

Metal Fabrication Lab
- CNC Plasma Cutter, Mill, and Laser Engraver (25 watt)
- CNC Plasma Cutter, Mill, and Laser Engraver (120 watt)
- Machining, Welding, and Sheet Metal Equipment
- In-house Powder Coating

Plastic Fabrication Lab
- Large Format Vacuum Forming, Thermo Forming and general tool set-up
- Mill
- Casting equipment

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

Professionally-Staffed Open Lab Schedule
- Woods, Metals, Plastics
- Cintiq and Intuous Tablets
- Industrial Sewing Machines
- Wind Tunnel
- Equipped Photo Studio
FACILITIES & EQUIPMENT

CNC Router

3D Printer

Pen Tablet Input

Laser Cutter

CNC Plasma Cutter

SLA

FDM 3D Printer

Tablet Input

3D Printer

Cintiq Tablet Input

3D Printer

Wind Tunnel
Program Description

The Industrial Design program focuses on teaching the skills, knowledge, and dispositions required to facilitate product design for manufacturing industries. An industrial designer typically creates new product ideas or re-designs existing products in a collaborative effort with marketing, engineering, and production teams. Designers create and develop product ideas and then communicate those ideas to clients and production entities through technical drawings, concept and final renderings, mock-ups, models and prototypes.

The curriculum at MSU Denver prepares students for professional design practice by teaching graphic and verbal presentation skills as well as hands on technical skills to enhance their innate creativity. Collaborative projects with other disciplines and industry partners are a vital part of the curriculum and typically occur in the design studio classes. Students also do a professional internship as their senior experience to further enhance the real world learning the department strives for. Students are required to pass through a portfolio review process at the end of the sophomore year to allow registration for upper division studio courses thus maintaining the quality of the program’s graduates. The details of this process are outlined on the department website and available in hard copy at the department office, located in the Boulder Creek building, room 124. Graduates earn a Bachelor of Science Degree. A minor in Industrial Design is also available.

Program Goals

The department goals to fulfill the mission are:

1. To employ faculty who have appropriate professional and academic experience, demonstrate excellence in teaching, perform scholarly activity, and contribute meaningful service to the university and the community.

2. To offer a curriculum that continually develops the skills, knowledge, and dispositions that allow success in the practice of Industrial Design. To incorporate and maintain currency with technologies used in the field.

3. To develop new professional collaborations and innovative approaches that emphasize practical experiences and critical thinking.

4. To produce lifelong learners inspired by diverse disciplines and cultures, and prepare them for future success in a global society.

Outcomes For All IND Majors

To the standard of an entry-level professional designer, graduating students should be able to:

1. Perform design research that contributes to the definition and solution of design problems.

2. Formulate multiple creative design solutions for a given problem, assess those concepts and select the most appropriate final design.

3. Demonstrate proficient skills in; sketching and rendering with appropriate media, technical drawing, 3-D physical and computer modeling and prototyping.

4. Develop final design solutions to optimize appropriate use of materials, manufacturing processes, user safety and marketability.

5. Prepare presentations that demonstrate quality visual organization, verbal skills, writing proficiency and professionalism.

6. Produce designs that address human-centered design and demonstrate an understanding of diverse cultural and global contexts.
STUDENT WORK

More student work can be found at: www.MSUdenver.edu/ind
Alumni Report

Industrial Design is an extremely global discipline. Graduates of the program are employed in a wide variety of ways using their ID degree. The department surveys alumni periodically to determine what types of employment opportunities they have received. A summary of results follows:

This report is based on data elicited from 48 responses to a survey of MSU Denver Industrial Design alumni distributed in July of 2014.

Job Categories

46 of the 48 respondents are employed in positions directly utilizing the skills and knowledge gained from their Industrial Design degree. The categories represented and corresponding numbers of graduates employed in those categories are below. 33 of the 48 alumni directly using their degree in their position are working in Colorado.

- Product design and development - 23 placements
- Computer based jobs/drafting - 9 placements
- Exhibit design - 4 placements
- Entrepreneurial Product design - 4 placements
- Model making/Artisans/Technicians - 1 placements
- Other design related jobs – 5 placements

Product Design and Development

Determine appropriate production processes, prototype, participate in design of new products, hand sketching, conduct site visits, create drawings, design products, 3-D/Solid Works modeling, test products, design, research, testing, redesign, project Management, product design and development, develop packaging and merchandising, conceptual design, prototyping and concept validation, mechanical design and documentation, technical drawings, create bills of materials, manage Chinese suppliers, research and 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, manage drawing documentation.

Exhibit Design

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.

Entrepreneurial Product Design

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.

Model Making/Artisans/Non-computer Technicians

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.

Computer Based Jobs/Drafting

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.
MSU Denver Industrial Design Community Partners

Industrial Designers Society of America (IDSA)

The Industrial Designers 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

The student Chapter maintains an active Facebook page to post relevant design news as well as updates for new events happening with IDSA. Follow us at https://www.facebook.com/groups/iDSA.MSUdenver/

Metropolitan State University of Denver IDSA contact information: IDSA@msudenver.edu

IDSA Faculty Advisors:
David Klein, Professor
303-615-0695
kleind@msudenver.edu

Professional Resources:

- Industrial Designers Society of America (IDSA) - www.idsa.org/
- Association of Women Industrial Designers - www.awidweb.com/
- Core77 - www.core77.com
- Coroflot - www.coroflot.com
- Designboom - www.designboom.com
AHEC - mobile recycling station
Autotron - design and manufacturing of automotive accessories
Big Chill - home appliance design, assembly, marketing
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 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
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
Miles Ahead Inc. - event planning
Monigle Associates Design - signage, corporate identity
Morris Manufacturing - wood fabrication
Mountainsmith - outdoor gear design and manufacture
MRK Cosmetics - cosmetic tools
Omerica Organic - jewelry design and manufacture
Optibike - electric bikes
Orthopets - design and fabrication of adaptive equipment for pets
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
Samson Design - full service product design
Samsung Electronics - design and manufacture
Schacht Spindle CO. - wood products, design, fabrication and assembly
Shike Design - interior and product design consultancy
Smartco, Int'l - design and manufacturing of small kitchen electrics
Sound in 3D
South of Ed Designs - signage, point of purchase displays
Speck Design - international design firm
Studio West - design consultancy
Sunrise Medical - wheelchair design and manufacture
Swisslog Manufacturing - pneumatic transport systems
The Children's Museum
The Lighting Studio - lighting design for residential and corporate
Theisen Sprinkler Company - sprinkler system design
Veltec Sports - bicycle clothing design and manufacture
VP Bicycle Components - design and manufacture
Wood Logic - design and manufacture of storage products
Zeitgeist - furniture studio
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 national and international design industries and universities around the world. Our students gain real world design experiences through industry-sponsored projects within their major design courses, interacting with professional designers on their projects. Our students also complete the internship experience in a design field of the student’s choosing, typically in pursuit of his or her future career. Students also have an opportunity to study abroad in other countries. From a short-term, two week design workshop, to a full academic year, our students have the chance to learn the design cultures of other countries, broaden their global perspectives, and build international relationships. All which will make our students more globally competent.

### Our Partnerships

<table>
<thead>
<tr>
<th>Academic &amp; Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our Partnerships</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Academic &amp; Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our Partnerships</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>sadi</td>
</tr>
<tr>
<td>samsung art and design institute</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yeungnam 1947 University</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universitas Quinquecidentis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pécsi Tudományegyetem University of Pécs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fachhochschule Dortmund</td>
</tr>
<tr>
<td>University of Applied Sciences and Arts</td>
</tr>
</tbody>
</table>
Degree Requirements 2017-2018 IND Major for Bachelor of Science (No Minor Required)

**Required Courses Semester Hours**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 1010</td>
<td>Composing Arguments (formally Freshman Composition)</td>
<td>(3 semester hours)</td>
</tr>
<tr>
<td>ENG 1020</td>
<td>Freshman Composition: Research, Analysis &amp; Documentation (Written Comm.)</td>
<td>(3 semester hours)</td>
</tr>
<tr>
<td>MTH 1210</td>
<td>Introduction to Statistics (Quantitative Literacy)</td>
<td>(4 semester hours)</td>
</tr>
<tr>
<td>PHY 1000</td>
<td>Introduction to Physics (Natural and Physical Science)</td>
<td>(4 semester hours)</td>
</tr>
<tr>
<td>PSY 1001</td>
<td>Introductory Psychology (Prerequisite for PSY 4410 (Social and Behavioral Science II))</td>
<td>(3 semester hours)</td>
</tr>
<tr>
<td>CAS 1010</td>
<td>Public Speaking (Communication)</td>
<td>(3 semester hours)</td>
</tr>
<tr>
<td>ARTH 1500</td>
<td>Art and Visual Literacy (Arts and Humanities)</td>
<td>(3 semester hours)</td>
</tr>
<tr>
<td>ARTH 1700</td>
<td>World Art II: Art 1400-1900</td>
<td>(3 semester hours)</td>
</tr>
<tr>
<td></td>
<td>Three hours of Social and Behavioral Science I †</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Three Hours of Natural and Physical Science †</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Three hours of Historical †</td>
<td></td>
</tr>
</tbody>
</table>

**Include a Multi-Cultural Course *†**

Subtotal 35

†Among approved general studies courses

*All of the courses listed may be used to satisfy General

**University Requirements Required Courses Semester Hours**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 1101</td>
<td>Studio Foundations: 2D</td>
<td>(3 semester hours)</td>
</tr>
<tr>
<td>ART 1141</td>
<td>Drawing I: Black and White</td>
<td>(3 semester hours)</td>
</tr>
<tr>
<td>ART 1501</td>
<td>Studio Foundations: 3D</td>
<td>(3 semester hours)</td>
</tr>
<tr>
<td>IND 1000</td>
<td>Introduction to Industrial Design</td>
<td>(1 semester hours)</td>
</tr>
<tr>
<td>IND 1010</td>
<td>Woods: Materials &amp; Fabrication</td>
<td>(3 semester hours)</td>
</tr>
</tbody>
</table>

**Subtotal 73**

Electives (Must be relevant to Industrial Design) 12
Students must consult with an IND Faculty Advisor before selecting electives.

Total 120
Degree Requirements 2017-2018 IND Minors for Bachelor of Science

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. The minor may also receive interest from students in areas that are linked to design such as, Art, Technical Communications, and Engineering.

Required Courses Semester Hours

IND 1000 Introduction to Industrial Design (1 semester hours)
IND 1010 Woods: Materials & Fabrication (3 semester hours)
IND 1130 Plastics: Materials & Fabrication (3 semester hours)
IND 1450 Technical Drawing and CAD (3 semester hours)
IND 1470 Design Drawing Techniques (formerly Perspective Drawing Techniques) (3 semester hours)
IND 2455 Industrial Design Studio for Non-Majors † (3 semester hours)
IND 2830 Manufacturing Materials and Processes (3 semester hours)
IND 3950 History of Industrial Design (3 semester hours)

Total 22

(† Minor students should register for IND 2450. Once course is passed, a CAPP adjustment can be done to reflect IND 2455)

IND Bachelor of Science degree requires 120 credit hours

To be awarded a degree, the student must complete the departmental requirements, General Studies, and ID core requirements. Students should consult with faculty advisors for selection and approval of a proposed plan of study.

Departmental Requirements and Policies

In addition to meeting the course requirements for General Studies and the ID core, all ID 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. A registration hold will be applied to a student’s account until they meet with their advisor.

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

The Industrial Design program at The Metropolitan State University of Denver is the only (NASAD) National Association of Schools of Art and Design accredited ID program in Colorado.

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)
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 1130-3 Plastics: Materials and Fabrication (1+4)
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)
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 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 1010, IND 1130, IND 1250, IND 1450, IND 1470, and IND 2100
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 1010, IND 1450, IND 1470
Corequisites: IND 1130, 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 (3+0)

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 problem-solving methods for business and manufacturing applications.

IND 3050-3 Advanced Sketching (1+4)

ELECTIVE - 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 1130
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)

Prerequisite: IND 1010, IND 1130, IND 1250, 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. Credit will be granted for only one prefix: IND 3660 or MET 1210.
**Prerequisites:** IND 1450, IND 1470

**IND 3330-3 Furniture Design (1+2)**

**ELECTIVE - Prerequisite: IND 1010 or ART 1300, IND 1450**

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)**

**ELECTIVE - 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 development 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 1010, IND 1130 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)**

**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 the preparation of presentation materials for public use, furniture competition 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 on real-world, new product development principles. Students learn the 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+10)**

**Prerequisite: IND 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 4200-3 Utilization of Composites in Manufacturing (1+4)**

**ELECTIVE - Prerequisite: IND 3100**

In this combination lecture and laboratory course, students build upon the skills and knowledge acquired in IND 3100 - Composites: Materials and Fabrication utilizing design and fabrication projects to inform how they can use composite materials for advanced manufacture. The course will provide instruction in advanced composite fabrication techniques and relevant equipment for composite-based manufacture.
CURRICULUM

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

ELECTIVE — Prerequisite: IND 1450 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 3450, IND 3800
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 4860-2 Research in Industrial Technology (2+4)

Prerequisite: Senior standing; IND major
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 4870-1-5 Special Studies in Industrial Design (2+4)

Prerequisite: Permission of instructor
A study and investigation of a selected topic in the field of industrial design. Student may repeat this course in alternate concentrations.

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. Coursework 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. (General Studies-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 2017-2018 Academic Year Tuition and Fees

For more information on Tuition, Fees, and Deadlines:

OFFICE OF THE BURSAR
Phone: 303-615-0070
www.msudenver.edu/bursar/
email: bursar@msudenver.edu

ADMISSIONS
303-615-1999
www.msudenver.edu/admissions
askmetro@msudenver.edu

Mailing Address (for official transcripts):

Metropolitan State University of Denver
Office of Admissions
Campus Box 16 PO Box 173362
Denver, CO 80217-3362

Estimated cost per semester is as follows:

Tuition and Mandatory Fees

<table>
<thead>
<tr>
<th></th>
<th>12-18 Credit Hours per semester</th>
<th>3 Credit Hours per semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident</td>
<td>$3,676.36*</td>
<td>$1,135.61*</td>
</tr>
<tr>
<td>Non-resident</td>
<td>$10,074.76</td>
<td>$2,735.21</td>
</tr>
</tbody>
</table>

IND Program Fee - $18.00 per credit total fee depends on number of credit hours

Books and Supplies Costs vary depending on courses taken

* Note: Resident less stipend plus mandatory fees. Tuition estimates based on Fall '17/Spring '18 rates.

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 the award of credit hours. 34CFR 600.2 (11/1/2010)

Scholarships and Awards

MSU Denver Scholarship Application Process

Complete the MSU Denver Financial Aid Guide, FASA, & Scholarship Application

• Complete online at:
  http://www.msudenver.edu/enroll/financialaid/scholarship

• Prepare a hard copy by obtaining the application

• Visit the Financial Aid Office in Central Classroom

MSU Denver Awards:

• ID Portfolio Excellence Scholarship

• ID Outstanding Senior Student Award

• Outstanding Students of The College of Professional Studies (CPS)

• IDSA Merit Award
College Of Professional Studies

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