The Master of Design (MDes) degree program is a three-semester, professional graduate degree in design that integrates human-centered design with a sophisticated understanding of technology to prepare students to excel in creative practices today and design the thoughtful technologies of tomorrow. Jointly offered by the College of Engineering and the College of Environmental Design, the program’s interdisciplinary curriculum connects technical rigor, design theory, and social practice and prepares students for a broad range of creative and technical roles for designing innovative products, services, and environments.

Housed at the Jacobs Institute for Design Innovation, the MDes provides a dynamic, hands-on curriculum that uniquely equips students to develop a critical perspective and navigate a range of technical languages and design methodologies. Studio-based coursework integrates programming, human-centered design process, and communication with hardware and software development. Exploratory project briefs encourage students to use design process to identify new problem spaces and to explore ideas through co-creative processes, iteration, and prototyping. A set of debate-focused seminars help shape students’ critical lens on design through analysis and discussion of the ethical, ecological, and societal implications of practice within an evolving environmental and socio-technology landscape. Students further deepen their knowledge through technical electives and offerings in social practice or entrepreneurship relevant to their interests and career goals. Their studies culminate in a Design Studio where they work in teams and bring their distinct perspectives to bear on applied projects.

With support from MDes Career Services, students enhance their academic preparation through Design@Large — an opportunity outside of an MDes course or studio where they apply what they have learned in a professional context, typically in the summer between their second and third semesters (see Professional Development Activities).

The Master of Design (MDes) is designed for early to mid-career professionals with an interest in pursuing graduate work at the intersection of design and technology, with applications that might include artistic production, technological innovations, product or communication design, and design experiences or interventions, etc. Competitive applicants have some prior technical preparation and an interest in design as a creative, goal-oriented activity that can contribute to the emergence of innovative new technologies and environments.

Application Criteria

The following are required for admission to the Berkeley MDes program. The following includes the University’s general graduate admission requirements:

- Online Application
- Application Fee
- University Transcripts
- Curriculum Vitae (CV) or Resume, showing relevant work and/or research experience
- Two Essays (personal statement and statement of purpose)
- Three Letters of Recommendation
- Project portfolio, showing previous design work
- English Language Proficiency Requirement (if required)
- The GRE Exam is not required.

In addition, students may be invited for an interview, either in-person or remote, and should be prepared to explain their qualifications, motivations to apply to the program, and goals for the program.

Portfolio Requirements

All applicants are required to submit a portfolio that demonstrates their creative and technical proficiency. Depending on your individual practice, this may include examples of visual design work, software systems, interactive electronics, videos, paintings, 3D models, ceramics, performances, musical compositions, social practices, or many other types of creative or technical pursuits. Your portfolio should be legible to a general audience of designers, and should not only present representations of final outcomes/designs in their intended contexts, but also accounts of your design process, and samples of early design iterations. Portfolios are expected to include both images and supporting text and should convey the context from which the project arose and the lens through which to understand and critique the work. Collaborative work is encouraged, but please credit all authors and highlight your specific contribution. Similarly, academic, professional, and personal work are all welcome, but please differentiate these distinct types of work.

In our experience, strong portfolios often opt to describe a limited selection of projects in depth, rather than account for a large breadth of projects superficially. We suggest highlighting between 3–5 of your most compelling exemplars of creative work. The most important role of a portfolio is to clearly communicate your skills, experience, and perspective. Your portfolio must include your name and contact information and be submitted as a stand-alone PDF formatted document. You may submit your portfolio of up to 20 pages maximum and 20MB total PDF file size. Portfolios that are submitted in excess of this page and size restriction will not be reviewed by the admissions committee. Any URLs or links to outside materials within your portfolio or elsewhere in your application will not be reviewed. You may optionally include up to two minutes of additional time-based media (audio/video).

Graduate Division Admissions

Applying for Graduate Admission

Thank you for considering UC Berkeley for graduate study! UC Berkeley offers more than 120 graduate programs representing the breadth and depth of interdisciplinary scholarship. A complete list of graduate academic departments, degrees offered, and application deadlines can be found on the Graduate Division website (http://grad.berkeley.edu/programs/list/).

Prospective students must submit an online application to be considered for admission, in addition to any supplemental materials specific to the program for which they are applying. The online application can be found on the Graduate Division website (http://grad.berkeley.edu/admissions/).

Admission Requirements

The minimum graduate admission requirements are:

1. A bachelor’s degree or recognized equivalent from an accredited institution;

2. A satisfactory scholastic average, usually a minimum grade-point average (GPA) of 3.0 (B) on a 4.0 scale; and
The Master of Design (MDes) program requires nine core courses and three electives (see below) for a minimum of 38 credits for the degree.

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DES INV 200</td>
<td>Design Frameworks: History &amp; Methods</td>
<td>3</td>
</tr>
<tr>
<td>DES INV 201</td>
<td>Debates in Design (Students are required to take this course twice; once during the fall semester in year one, and again during the fall semester of year two.)</td>
<td>3</td>
</tr>
<tr>
<td>DES INV 202</td>
<td>Technology Design Foundations</td>
<td>4</td>
</tr>
<tr>
<td>DES INV 211</td>
<td>Designing Emerging Technologies I</td>
<td>5</td>
</tr>
<tr>
<td>DES INV 212</td>
<td>Designing Emerging Technologies II</td>
<td>3</td>
</tr>
<tr>
<td>DES INV 213</td>
<td>Design Studio</td>
<td>5</td>
</tr>
<tr>
<td>DES INV 219</td>
<td>Capstone Portfolio</td>
<td>2</td>
</tr>
<tr>
<td>DES INV 290</td>
<td>Advanced Special Topics in Design Innovation</td>
<td>1-4</td>
</tr>
<tr>
<td>ENGIN 183</td>
<td>Special Topics in Technology Innovation and Entrepreneurship</td>
<td>1-4</td>
</tr>
</tbody>
</table>

**Elective Courses**

The MDes requires three electives: one technical elective, and at least one entrepreneurship or social practice elective from the approved lists of courses, shown below. The third elective may be either an additional elective from the approved list (technical, social practice, or entrepreneurship) or any 3 or 4 unit upper division or graduate level course offered at UC Berkeley, subject to enrollment availability. Students may submit petitions for alternate courses to the Executive Director.

**Approved Technical Electives**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 249</td>
<td>Special Topics in the Physical Environment in Buildings</td>
<td>1-4</td>
</tr>
<tr>
<td>ARCH 252</td>
<td>Form and Structure</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 259</td>
<td>Special Topics in Building Structures</td>
<td>1-4</td>
</tr>
<tr>
<td>ARCH 269</td>
<td>Special Topics in Construction and Materials (Indoor Microbiome, Detoxification, and Artificial Intelligence and Matter; Plant Fibers and Design: Origins and Future; Timber Frame and Mass Timber Construction )</td>
<td>1-4</td>
</tr>
<tr>
<td>ART 172</td>
<td>Advanced Digital Media: Computer Graphics Studio</td>
<td>4</td>
</tr>
<tr>
<td>CIV ENG 190</td>
<td>Special Topics in Civil and Environmental Engineering</td>
<td>1-4</td>
</tr>
<tr>
<td>COMPSCI 161</td>
<td>Computer Security</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI 169A</td>
<td>Introduction to Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>COMPSCI 188</td>
<td>Introduction to Artificial Intelligence</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI 194</td>
<td>Special Topics (Data Engineering)</td>
<td>1-4</td>
</tr>
<tr>
<td>COMPSCI 260B</td>
<td>Human-Computer Interaction Research</td>
<td>3</td>
</tr>
<tr>
<td>COMPSCI 184</td>
<td>Foundations of Computer Graphics</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI 28A</td>
<td>Foundations of Computer Graphics</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI 188</td>
<td>Introduction to Artificial Intelligence</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI C200A</td>
<td>Principles and Techniques of Data Science</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI C249A</td>
<td>Introduction to Embedded Systems</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI 260A</td>
<td>User Interface Design and Development</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI 264A</td>
<td>Foundations of Computer Graphics</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI 287H</td>
<td>Algorithmic Human-Robot Interaction</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI 289A</td>
<td>Introduction to Machine Learning</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI 294</td>
<td>Special Topics (Intro to Computer Vision and Computational Photography)</td>
<td>1-4</td>
</tr>
<tr>
<td>COMPSCI 297</td>
<td>Field Studies in Computer Science (Immersive Computing and Virtual Reality)</td>
<td>12.0</td>
</tr>
<tr>
<td>CY PLAN 257</td>
<td>Data Science for Human Mobility and Socio-technical Systems</td>
<td>4</td>
</tr>
<tr>
<td>DATASCI 207</td>
<td>Applied Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>ENGIN 150</td>
<td>Basic Modeling and Simulation Tools for Industrial Research Applications</td>
<td>3</td>
</tr>
<tr>
<td>IND ENG 290</td>
<td>Special Topics in Industrial Engineering and Operation Research (Entrepreneurship &amp; Innovation: Data-X (Applied Data Science with Venture Application))</td>
<td>2-3</td>
</tr>
<tr>
<td>INFO 253A</td>
<td>Front-End Web Architecture</td>
<td>3</td>
</tr>
<tr>
<td>INTEGBI/BIO</td>
<td>Biomimetic Engineering -- Engineering from Biology</td>
<td>3</td>
</tr>
<tr>
<td>MEC ENG C217</td>
<td>Applied Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>MAT SCI 200A</td>
<td>Survey of Materials Science</td>
<td>4</td>
</tr>
<tr>
<td>MEC ENG 122</td>
<td>Processing of Materials in Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>MEC ENG C201</td>
<td>Modeling and Simulation of Advanced Manufacturing Processes</td>
<td>3</td>
</tr>
<tr>
<td>MEC ENG 236U</td>
<td>Control and Dynamics of Unmanned Aerial Vehicles</td>
<td>3</td>
</tr>
<tr>
<td>MEC ENG 270</td>
<td>Advanced Augmentation of Human Dexterity</td>
<td>4</td>
</tr>
<tr>
<td>MEC ENG 280A</td>
<td>Introduction to the Finite Element Method</td>
<td>3</td>
</tr>
<tr>
<td>MUSIC 159A</td>
<td>Sound and Music Computing with CNMAT Technologies</td>
<td>4</td>
</tr>
<tr>
<td>MUSIC 159</td>
<td>Computer Programming for Music Applications</td>
<td>4</td>
</tr>
<tr>
<td>NWMEURO 190</td>
<td>Special Topics in New Media (Advanced Digital Animation)</td>
<td>1-4</td>
</tr>
<tr>
<td>NWMEURO C203</td>
<td>Critical Making</td>
<td>4</td>
</tr>
<tr>
<td>NWMEURO/INFO</td>
<td>Theory and Practice of Tangible User Interfaces (Advanced Digital Animation)</td>
<td>4</td>
</tr>
</tbody>
</table>

**Approved Entrepreneurship Electives**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGIN 183C</td>
<td>Challenge Lab</td>
</tr>
<tr>
<td>ENGIN 183D</td>
<td>Product Management</td>
</tr>
<tr>
<td>ENGIN 183</td>
<td>Special Topics in Technology Innovation and Entrepreneurship</td>
</tr>
<tr>
<td>ENGIN 283</td>
<td>Special Topics in Technology Innovation and Entrepreneurship</td>
</tr>
</tbody>
</table>

**Approved Social Practice Electives**
The goal of the Master of Design (MDes) program is to educate a cohort of designers to have a deep understanding of the foundations of emerging technologies and a rigorous design approach for analyzing ethical, ecological and societal implications of a continuously evolving environmental and socio-technology landscape. To meet this goal, MDes students are expected to:

- Master methods of problem-conception and problem-solving at a range of social and ecological scales.
- Hone methods of implementation grounded in the creative practice of design.
- Gain core design skills, in terms of process, materials, craft, and representation.
- Deepen and expand their technical skills in 1-2 emerging technology areas.
- Explicitly consider contexts and impacts of design decisions.
- Use design as a tool for collaboration and team-work.
- Communicate design ideas effectively to diverse collaborators and audiences.
- Weave all of the above together in multiple practice-focused studios.

As part of enrollment in the program, each MDes student receives a Jacobs Maker Pass for access to Jacobs Hall makerspace and a materials budget each semester to purchase materials from the store at Jacobs Hall. Access to the Fabrication Shop in College for Environmental Design (CED) and to the CITRIS Innovation Lab is also included.

Starting in the second semester of the program, each MDes student is assigned a desk in the MDes studio to support their individual and collaborative work.

MDes students may apply for GSI positions, when they are available, for undergraduate design courses offered at The Jacobs Institute for Design Innovation. These teaching opportunities are optional and MDes students are expected to be able to balance GSI responsibilities with their own educational commitments with little difficulty.

MDes students are expected to complete Design@Large, a professional development requirement for the program. Design@Large requires students to engage in an experience outside of an MDes course or studio where they apply what they have learned in a broader context. Design@Large experience typically takes place in the summer between the Spring and Fall semesters and is uniquely defined to align with students’ interests and career goals.

MDes students may satisfy this requirement in the following ways:

- Securing an internship
- Having an international experience
- Contributing to a research project
- Launching or contributing to a new start-up or business
- Working in government, service or non-profit organization

The MDes Program provides Career Services advising and other resources to aid students in their pursuit of internships or other professional opportunities as part of this requirement. It is each student’s responsibility, however, to define and identify their Design@Large experience.

MDes students demonstrate the completion of the Design@Large requirement by documenting a project or contribution from their experience in DES INV 219: Capstone Portfolio, a culminating course, required for all MDes students in the last semester of the program.

In this course, students compile a portfolio of work that has been completed during the MDes program, selecting meaningful pieces that demonstrate the achievement of key learning objectives and highlight the underlying themes of their course of study in the program. As part of this documentation, the Capstone Portfolio must also include and reflect on underlying themes of their course of study in the program. As part of this requirement, students demonstrate the completion of the Design@Large requirement by documenting a project or contribution from their experience in DES INV 219: Capstone Portfolio, a culminating course, required for all MDes students in the last semester of the program.

In this course, students compile a portfolio of work that has been completed during the MDes program, selecting meaningful pieces that demonstrate the achievement of key learning objectives and highlight the underlying themes of their course of study in the program. As part of this documentation, the Capstone Portfolio must also include and reflect on their Design@Large experience.
DES INV 200 Design Frameworks: History & Methods 3 Units
Terms offered: Spring 2023, Spring 2022, Fall 2021
This course exposes students to the mindset, skillset and toolset associated with design, and interweaves practical design methods with readings and lectures on the history of design and technology.

DES INV 201 Debates in Design 3 Units
Terms offered: Fall 2023, Fall 2022, Fall 2021
As today’s most pressing challenges cut across disciplinary boundaries, designers need to articulate new methods for connecting conceptual knowledge with technical skills and develop new ways of integrating ideas from various perspectives and world views. Each year students in this colloquium-style course explore a topic in design. Invited lecturers present a relevant project or challenge from their professional careers at a given intersection of critical contemporary issues expressed at a particular scale of design practice. Speakers share background material or readings in advance, allowing students to arrive with thoughtful questions and discussion points. Students compose written reflections throughout and following each speaker.

DES INV 202 Technology Design Foundations 4 Units
Terms offered: Fall 2023, Fall 2022, Fall 2021
This course introduces foundational design and technology frameworks and builds skill sets essential to the design of products, services, and experiences enabled by emerging technologies. It follows a human-centered design process that includes research, concept generation, and prototyping, with an emphasis on iteration and refinement. It also develops fluency across a range of core technologies, from fabrication to micro-controllers, and how to operationalize them within a design context. These activities are supported by regular practice of design critique. Students engage with a highly technical semester-long project to create a product-service system leveraging both hardware and digital technologies that addresses a well-defined need.
DES INV 210 Studio Foundations 3 Units
Terms offered: Fall 2023
Studio Foundations introduces students to the key concepts of a design studio and the foundational principles and methods that inform the ways designers work, collaborate, and practice.

Rules & Requirements
Prerequisites: This course is only open to students in the first year of the Master of Design (MDes) program. There are no other prerequisites

Hours & Format
Fall and/or spring: 15 weeks - 2-3 hours of lecture and 1.5-2.5 hours of studio per week

Additional Details
Subject/Course Level: Design Innovation/Graduate
Grading: Letter grade.

DES INV 211 Designing Emerging Technologies I 5 Units
Terms offered: Spring 2023, Spring 2022, Fall 2021
This course is an intensive, project-based course that focuses on design of interactive artifacts that use emerging technologies. Students are led through a sequence of projects of varying lengths (from one week to three weeks). This serves as the first in a two part sequence of courses (with DES INV 212) intended to develop student skills in designing with technology as a material. Projects include both individual and team activities, with teams frequently changing in size and composition.

Rules & Requirements
Prerequisites: Students must have either completed or be concurrently enrolled in DES INV 202: Technology Design Foundations and DES INV 200: Design Frameworks

Hours & Format
Fall and/or spring: 15 weeks - 3 hours of lecture and 3 hours of laboratory per week

Additional Details
Subject/Course Level: Design Innovation/Graduate
Grading: Letter grade.
Instructor: ERIC PAULOS

DES INV 212 Designing Emerging Technologies II 3 Units
Terms offered: Fall 2022, Spring 2022
This course is an intensive, project-based course which serves as part of the core required curriculum for students in the Master of Design program. Students are led through a sequence of projects of varying lengths (from one week to one month). The course builds on Designing Emerging Technologies I, and focuses on developing fluency with a different set of technologies. Projects include both individual and team activities, with teams frequently changing in size and composition.

Rules & Requirements
Prerequisites: DES INV 211: Designing Emerging Technologies I

Hours & Format
Fall and/or spring: 15 weeks - 1.5 hours of lecture and 1.5 hours of laboratory per week

Additional Details
Subject/Course Level: Design Innovation/Graduate
Grading: Letter grade.

DES INV 213 Design Studio 5 Units
Terms offered: Fall 2023, Fall 2022, Spring 2022
In this course you will participate in a hands-on design studio focused on key topics of concern related to design and technology innovation. The primary goal of this course is to orient students to fabrication, building technologies, and fundamental design production skills in a studio environment. A key secondary goal is to provide students the opportunity to address a real world problem and provide an application or solution. Themes and project topics, as well as subject matter expertise, are provided by either external partners, including companies, local governmental offices, or nonprofits, or provided by faculty and related to research interests.

Rules & Requirements
Prerequisites: Students must be concurrently enrolled in DES INV 219: Capstone Portfolio

Hours & Format
Fall and/or spring: 15 weeks - 6 hours of studio and 2 hours of lecture per week

Additional Details
Subject/Course Level: Design Innovation/Graduate
Grading: Letter grade.
DES INV 219 Capstone Portfolio 2 Units
Terms offered: Fall 2023, Fall 2022, Spring 2022
In this culminating course for the MDes degree, you compile a portfolio of work that has been completed during the MDes program, selecting at least four meaningful pieces that demonstrate the achievement of key learning objectives and highlight the underlying themes of your course of study. Two projects should be deeper investigations of projects done in previous classes. The third project featured should be a deep dive into the project pursued in studio. The fourth entry of the portfolio should reflect on Design@Large, an experience you have had outside of an MDes course or studio where you have furthered your design knowledge and expertise within a broader context.
Capstone Portfolio: Read More [+]

Rules & Requirements

Prerequisites: Culminating course taken at the end of the MDes program

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Design Innovation/Graduate

Grading: Letter grade.

Capstone Portfolio: Read Less [-]

DES INV 290 Advanced Special Topics in Design Innovation 1 - 4 Units
Terms offered: Fall 2023, Spring 2023, Fall 2022
Selected advanced topics in design innovation.
Advanced Special Topics in Design Innovation: Read More [+]

Rules & Requirements

Prerequisites: Varies by topic. Check syllabus and/or Jacobs Institute website for specific prerequisites

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring:
7 weeks - 1-8 hours of lecture per week
8 weeks - 1-8 hours of lecture per week
15 weeks - 1-4 hours of lecture per week

Summer:
6 weeks - 2-10 hours of lecture per week
8 weeks - 2-10 hours of lecture per week

Additional Details

Subject/Course Level: Design Innovation/Graduate

Grading: Letter grade.

Advanced Special Topics in Design Innovation: Read Less [-]