

# MASTER OF ENGINEERING IN ARCHITECTURAL ENGINEERING

The Master of Engineering in Architectural Engineering is a coursework-only graduate degree program oriented toward students who wish to develop more knowledge about the design, construction, and operation of buildings and their systems, including heating, ventilation, and air-conditioning (HVAC) systems, facades and enclosures, and electrical, lighting, fire protection, and plumbing systems. The degree program is intended for preparation for advanced engineering practice rooted in the principles of building science, indoor environmental quality, energy efficiency, and sustainability.

Students with a variety of academic backgrounds are eligible to apply for the program, including those with undergraduate degrees in engineering disciplines (e.g., architectural, civil, mechanical, or environmental engineering) and non-engineering disciplines (e.g., architecture, construction management, or environmental design). All admitted students are expected to have passed thermodynamics and fluid mechanics in their undergraduate studies. If students have not passed these courses, they may be required to take proficiency courses in their first year of study or in the summer before their first year of study. Each applicant will be evaluated on a case-by-case basis during the application review process to determine any proficiency course requirements.

Up to 12 credit hours of 400-level undergraduate coursework may be included in the program with adviser approval.

## Curriculum

| Code   | Title  | Credit Hours |
|--|--|--------------|
| <b>Required Courses</b>                          |  | <b>(12)</b>  |
| CAE 513  | Building Science <sup>1</sup>  | 3            |
| CAE 526  | Energy Conservation in Buildings <sup>2</sup>                            | 3            |
| or CAE 465                                       | Energy Conservation in Buildings   |              |
| CAE 556  | Net Zero Energy Building Design I  | 3            |
| CAE 557  | Net Zero Energy Building Design II                                       | 3            |
| <b>Statistics/Data Analysis Requirement</b>      |  | <b>(3)</b>   |
| CAE 523  | Statistical Analysis of Engineering Data                                 | 3            |
| or MATH 474                                      | Probability and Statistics   |              |
| or MATH 564                                      | Applied Statistics   |              |
| or MMAE 500                                      | Data Driven Modeling   |              |
| or BME 533                                       | Biostatistics  |              |
| <b>Elective Courses</b>                          |  | <b>(15)</b>  |
| Select 15 hours from the following: <sup>3</sup> |  | 15           |
| CAE 461  | Plumbing and Fire Protection Design                                      | 3            |
| CAE 466  | Building Electrical/Lighting Systems Design                              | 3            |
| CAE 467  | Lighting Systems Design  | 3            |
| CAE 474  | Introduction to Building Information Modeling                            | 3            |
| CAE 505  | Applications of Computational Fluid Dynamics in Engineering <sup>2</sup> | 3            |
| or CAE 405                                       | Applications of Computational Fluid Dynamics in Engineering              |              |
| CAE 506  | Building Envelope Rehabilitation   | 3            |
| CAE 515  | Building Energy Modeling   | 3            |
| CAE 517  | HVAC Systems Design <sup>2</sup>   | 3            |
| or CAE 464                                       | HVAC Systems Design  |              |
| CAE 519  | Structural Forensic Engineering  | 3            |
| CAE 524  | Building Enclosure Design <sup>2</sup>                                   | 3            |
| or CAE 463                                       | Building Enclosure Design  |              |
| CAE 538  | Control of Building Environmental Systems <sup>2</sup>                   | 3            |
| or CAE 438                                       | Control of Building Environmental Systems                                |              |
| CAE 550  | Applied Building Energy Modeling   | 3            |
| CAE 553  | Measurement and Instrumentation in Architectural Engineering             | 3            |
| CAE 554  | Building Commissioning <sup>2</sup>                                      | 3            |
| or CAE 454                                       | Building Commissioning   |              |

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|-------------------------|---|---|
| CAE 569<br>or CAE 470   | Construction Methods, Cost Estimating, and Project Budgeting <sup>2</sup><br>Construction Methods and Cost Estimating | 3 |
| ENVE 503<br>or ENVE 403 | Occupational and Environmental Health and Safety <sup>2</sup><br>Occupational and Environmental Health and Safety     | 3 |
| ENVE 576                | Indoor Air Pollution  | 3 |
| MMAE 517                | Computational Fluid Dynamics  | 3 |

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**Total Credit Hours** **30**

- <sup>1</sup> Students who have previously passed an equivalent course in their prior degree programs may substitute another course for CAE 513 with adviser approval.
- <sup>2</sup> For courses that are cross-listed with both graduate and undergraduate sections, students in the program should prioritize taking the graduate (500-level) section. Accelerated master's students can take either section that best fits their plan of study.
- <sup>3</sup> Other elective courses in ARCH, CAE, CHE, CHEM, EG, EMS, ENVE, MMAE or other disciplines can also be taken with advisor approval.