

Artificial Intelligence, Modeling and Simulation in Engineering, Graduate Certificate

Requirements

The graduate Certificate in Artificial Intelligence, Modeling and Simulation (AIMS) requires a minimum of 15 s.h. of graduate coursework. To earn the certificate, the student is required to attain a minimum grade-point average of 3.00 in coursework specifically for the certificate.

Students are strongly encouraged to participate in at least one workshop related to Python, R, or high performance and parallel computing offered by the Information Technology Services Research Services (ITS-RS) department, and HACKUIOWA organized by the University of Iowa's Hydroinformatics Lab.

The Certificate in Artificial Intelligence, Modeling and Simulation in Engineering requires the following coursework.

Required Courses

Students must complete at least two of the following courses but may choose to complete all three courses as part of the certificate.

| Course # | Title | Hours |
|------------------------|--|-------|
| At least two of these: | | |
| ME:5170 | Data-Driven Analysis in Engineering Mechanics | 3 |
| ME:5300 | Uncertainty Quantification and Design Optimization | 3 |
| ME:6255 | Multiscale Computational Science and Engineering | 3 |

Students select courses from the following list to reach a total of 12 s.h. of credit when combined with two or all three of the courses previously listed. Students may petition to substitute other relevant graduate-level courses for the following courses in consultation with the AIMS faculty advisor.

| Course # | Title | Hours |
|------------------------|---|-------|
| At least one of these: | | |
| ME:4117 | Finite Element Analysis | 3 |
| ME:4150 | Artificial Intelligence in Engineering | 3 |
| ME:4175 | Computational Naval Hydrodynamics | 3 |
| ME:5143 | Computational Fluid and Thermal Engineering | 3 |
| ME:6240 | Probabilistic Inference and Estimation for Mechanical Systems | 3 |
| ME:7256 | Computational Solid Mechanics | 3 |
| ME:7257 | Probabilistic Mechanics and Reliability | 3 |

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| ME:7269 | Computational Fluid Dynamics and Heat Transfer | 3 |
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Elective Course

In addition to the following courses, students may count a graduate-level course from another College of Engineering department or an independent investigation opportunity not in the following list in consultation with the AIMS faculty advisor.

| Course # | Title | Hours |
|---|---|-------|
| At least 3 s.h. from these: | | |
| ME:6198 | Individual Investigations: Mechanical Engineering | arr. |
| A mechanical engineering course (prefix ME) numbered 4100 or above | | |
| A chemistry, mathematics, or physics course (prefix CHEM, MATH, or PHYS) numbered 5000 or above | | |