**Certificate Requirements**

To satisfy the requirements for the Graduate Certificate in Cloud Computing, students must complete 12 semester credit hours as follows:

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| **A. Required Course** | 3 |
| Select one entry course: |
| CS 5573, EE 5243, IS 6973 | Topics in Systems and Control (Topic: Concepts in Cloud Computing) |
| Or a cross-listed course in CS and IS. The entry course is taught through team teaching in which instructor from each college contributes to the subjects outlined in the course syllabus. |
| **B. Track Electives** | 6 |
| Select two courses from one of the following tracks: |
| **Applications Track** |
| CS 5233 | Artificial Intelligence |
| CS 5263 | Bioinformatics |
| CS 5443 | Database Management Systems |
| CS 5463 | Topics in Computer Science |
| CS 5473 | Data Mining |
| CS 5493 | Large-Scale Data Management |
| CS 5573 | Cloud Computing |
| CS 6243 | Machine Learning |
| CS 6293 | Advanced Topics in Bioinformatics |
| EE 5243 | Topics in Systems and Control (Topic: Data Analytics with Cloud Computing) |
| EE 5243 | Topics in Systems and Control (Topic: Programming Techniques for the Cloud) |
| EE 5283 | Topics in Communication Systems (Topic: Internet of Things (IoT)) |
| EE 6363 | Advanced Topics in Signal Processing (Topic: Deep Learning) |
| EE 6973 | Special Problems (Topic: Machine Learning with Big Data) |
| IS 6703 | Introduction to Data Mining |
| ME 5013 | Topics in Mechanical Engineering (Topic: High Performance Computing) |
| **Security Track** |
| CS 6353 | Unix and Network Security |
| CS 6393 | Advanced Topics in Computer Security |
| IS 5513 | Fundamentals of Information Assurance |
| IS 6363 | Computer Forensics |
| **Infrastructure Track** |
| CS 5103 | Software Engineering |
| CS 5123 | Software Testing and Quality Assurance |
| CS 6353 | Unix & Network Security |
| CS 6463 | Advanced Topics in Computer Science |
| CS 6463 | Advanced Topics in Computer Science (Topic: Parallel and Distribute Systems Software) |
| CS 6523 | Distributed Operating Systems |
| CS 6543 | Networks |
| CS 6553 | Performance Evaluation |
| CS 6643 | Parallel Processing |
| EE 5103 | Engineering Programming |
| EE 5453 | Topics in Software Engineering (Topic: Advanced Data Structures and Algorithms) |
| EE 5453 | Topics in Software Engineering (Topic: Engineering Programming II)  |
| **C. Capstone Project** | 3 |
| Select one course from the following (topics should be in the field of Cloud Computing): |
| CS 5933 | Internship in Computer Science |
| CS 6953 | Independent Study |
| EE 6933 | Graduate Research Internship |
| EE 6943 | Graduate Project |
| EE 6953 | Independent Study |
| IS 6943 | Internship in Cyber Security |
| IS 6953 | Independent Study |
| CPE 7993 | Doctoral Dissertation |
| Total Credit Hours | 12 |