MASTER OF SOFTWARE ENGINEERING DEGREE TRACKS

Students seeking a professional focus in the Software Engineering program may choose to follow a “track,” which is a specific set of elective courses dedicated to a particular area of interest. These tracks are informal and intended to help students customize their education by selecting specific elective courses that align with their professional goals.

Students should work closely with their designated student advisor to outline course sequence and scheduling. Current tracks include:

1. Web and Mobile Development
2. Enterprise Architecture and Development
3. Software Testing
4. Networking
5. Databases

1. WEB AND MOBILE DEVELOPMENT

As the world becomes more digital by the day, organizations have no choice but to continue developing a stronger online presence. Concurrently, smartphones, tablets and other mobile devices have grown increasingly prevalent within both personal and professional circles. Websites and other applications used through mobile devices have serious impact and potential, and developers of such tools are in very strong demand.

Specialists in this area include web designers, mobile application developers, web programmers, mobile application architects, graphic designers and webmasters.

Elective courses forming this track include:

- RSEG 128 User Interface Design
- RSEG 161 Web Development Technologies
- RSEG 175 Mobile Applications and Responsive Web Design
- RSEG 185 Enterprise Content Management or RSEG 180 Software Development in C#

2. ENTERPRISE ARCHITECTURE AND DEVELOPMENT

Software developers who work on large software projects typically need to be familiar with a variety of technologies, design and architecture approaches, as well as development considerations that arise when working on projects that span multiple systems. Architectural and interaction frameworks, user interface design, enterprise-level technologies, and cloud computing are important tools in the arsenal of a developer or an architect working on large projects.

Specialists in this area include software architects, application architects, software engineers (senior levels), as well as specialists in the individual technologies used on enterprise-level projects.

Elective courses forming this track include:

- RSEG 128 User Interface Design
3. **SOFTWARE TESTING**

Software engineers working in the quality assurance and testing areas focus on validating software and verifying a variety of quality characteristics. The software testing process spans all areas of the software development lifecycle and is key to delivering quality software products. Software testing engineers work closely with many other members of software projects, including project managers, release engineers, developers, marketing and training teams.

Specialists in this area include software testing engineers, software quality assurance (QA) engineers, and software testers.

Elective courses forming this track include:

- **RSEG 122** Advanced Software Developing Methodologies
- **RSEG 125** Foundations of Software Quality Assurance
- **RSEG 128** User Interface Design
- **RSEG 181** Agile Software Development

4. **NETWORKING**

Software engineers focusing on networks employ technologies, frameworks, and operating system-level tools to enable software systems to run in a variety of computing platforms and communicate with each other. Networking and communication protocols form the foundation of public and private networks, allowing users to work with applications that can be located and distributed in a variety of architectural approaches. Network security is also an important concept in this area, as networked applications and data need protection against unauthorized access.

Specialists in this area include network engineers, network security engineers, software engineers – network systems, and system administrators – networks.

Elective courses forming this track include:

- **RSEG 110** Linux Tools or **RSEG 145** Linux Administration
- **RSEG 160** Computer Networking
- **RSEG 176** Cloud Computing or **RSEG 103** Software Development in C++
- **RSEG 290** Special Topics: Software Defined Networking

5. **DATABASES**

Data allows organizations to convert information into knowledge. By studying the architecture and technologies surrounding data, students learn the importance of database design, data modeling, warehousing and analytical processing. Concepts addressed include relational theory and database design; entity relationship modeling; normalization; issues of design and implementation; issues of database integrity, security, recovery and concurrence; and object-oriented databases.
Specialists in this area include database administrators, database managers, data analysts and data systems managers.

Elective courses forming this track include:

- **RSEG 170** Database Management
- **RSEG 171** Data Warehousing and Data Mining
- **RSEG 176** Cloud Computing or **RSEG 167** Service Oriented Architecture
- **RSEG 185** Enterprise Content Management or **RSEG 165** Design Patterns