# FERRIS STATE UNIVERSITY

# Digital Media Software Engineering
## Bachelor of Science Degree
## Wayne County Community College District (WCCCD)
### Transfer Guide

The Bachelor of Science in Digital Media Software Engineering is designed as a degree focused on the processes, procedures, and technology involved with software development. The degree will focus on fundamental computer science topics as well as processes and procedures commonly used in the production of software. This approach will provide students with the ability to construct software as well as the knowledge and understanding of the concepts used in commercial software development. This approach will allow graduates to seamlessly transition into the workforce integrating their knowledge of the industry and successfully design, develop, and deliver quality software applications. Software engineers are needed to create innovative software for health care, bio-informatics, business, entertainment, education, military, automotive industries, and more.

## Communication Competency Requirements

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| COMM 121 | Fundamentals of Public Speaking | 3 | SPH 101 | Fundamentals of Speech | 3 |
| ENGL 150 | English 1 | 3 | ENG 119 | English 1 | 3 |
| ENGL 250 | English 2 | 3 | ENG 120 | English 2 | 3 |
| ENGL 311 or | Advanced Technical Writing or | 3 | No Equivalent | No Equivalent | No Equivalent |
| ENGL 321 or | Advanced Composition or | | No Equivalent | No Equivalent | No Equivalent |
| ENGL 325 | Advanced Business Writing | | No Equivalent | No Equivalent | No Equivalent |

**Quantitative Literacy Requirements** - 3 Credits Required and is satisfied in the program's Major.

## Natural Sciences Competency Requirements – Two courses are required with a minimum of 6 credits: must have at least one lab course

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| PHYS 241 | General Physics 1 | 5 | PHY 265 | Physics for Scientists and Engineers 1 | 4 |
| Varies | FSU General Education – Natural Sciences Elective | Varies | Varies | Varies | Varies |

## Culture Competency Requirements - Minimum 9 credits from 2 different disciplines – PHIL 216 Met in Major

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| Varies | FSU General Education - Culture Electives | 6 | Varies | Varies | 6 |

## Self and Society Competency Requirements – Minimum 9 credits from 2 different disciplines – ECON 201 or 202 Met in Major

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| Varies | FSU General Education – Self and Society Competency | 6 | Varies | Varies | 6 |

## Ferris State University General Education Program

***Students are encouraged to work with an advisor to select appropriate general education courses***

### Diversity Competency – 2 Courses Required
If not met by courses taken for Culture, Self and Society, or MTA, a student must meet the following:
- 1 course with the Global Diversity attribute
- 1 course with the U.S. Diversity attribute

## Major Requirements – 95 Credits Required

### Software Development – 21 Credits Required

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| SENG 101 | Computer Programming 1 | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 102 | Computer Programming 2 | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 300 | Software Data Structures & Algorithms | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 301 | Programming Languages | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 315 | Software Component Design | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 400 | Engineering Enterprise Software Applications | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 430 | Programming Graphical User Interfaces | 3 | No Equivalent | No Equivalent | No Equivalent |

## Foundation – 21 Credits Required

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| SENG 160 | Software Engineering Methodologies & Processes | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 170 | Software Requirements Management | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 210 | Software Configuration Management | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 250 or ISYS 327 | Fundamentals of Operating Systems & Networking or Operating Systems & Network Essentials | 3 | No Equivalent or No Equivalent | No Equivalent or No Equivalent | No Equivalent or No Equivalent |
| SENG 302 | Software Quality Assurance | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 350 | Software Design & Architecture | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 355 | Software Engineering Emerging Tools & Paradigms | 3 | No Equivalent | No Equivalent | No Equivalent |

## Engineering Fundamentals – 9 Credits Required

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| ISYS 200 or SENG 225 or ISYS 272 | Database Design & Implementation or Introduction to Database Design or Fundamentals of Database Systems | 3 | CIS 120 or No Equivalent or No Equivalent | Introduction to Database Concepts or No Equivalent or No Equivalent | 3 or No Equivalent or No Equivalent |
| ECON 201 or ECON 202 | Principles of Microeconomics or Principles of Macroeconomics | 3 | ECO 102 or ECO 101 | Principles of Economics 2 or Principles of Economics 1 | 3 |
| STQM 260 | Introduction to Statistics | 3 | BUS 221 or MAT 131 | Business Statistics or Descriptive Statistics | 3 |

## Mathematics – 14 Credits Required

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| MATH 220 | Calculus with Analytical Geometry 1 | 4 | MAT 171 | Analytical Geometry and Calculus 1 | 4 |
| MATH 230 | Analytical Geometry – Calculus 2 | 4 | MAT 172 | Analytical Geometry and Calculus 2 | 4 |
| MATH 322 | Linear Algebra | 3 | MAT 272 | Linear Algebra | 4 |
| MATH 328 | Discrete Structures | 3 | No Equivalent | No Equivalent | No Equivalent |

## Business and Management – 9 Credits Required

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| PHIL 216 | Introduction to Ethics | 3 | PHL 221 | Ethics | 3 |
| PROJ 320 or DAGD 315 | Project Management Fundamentals or Digital Media Productions | 3 | PRM 220 or No Equivalent | Advanced Project Management or No Equivalent | 3 or No Equivalent |
| BLAW 321 | Contracts & Sales | 3 | No Equivalent | No Equivalent | No Equivalent |

## Professional Development – 9 Credits Required

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| SENG 420 | Software Development Industry Certification | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 491 | Applied Internship | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 499 | Capstone in Software Engineering | 3 | No Equivalent | No Equivalent | No Equivalent |

**Application Domain Electives** – 12 Credits Required– Choose one four-course sequence in an area of interest below. Sequences other than those listed must be approved by an advisor.

## Game Design and Development

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| DAGD 100 or DAGD 150 | 3D Modeling Animation or Intro to Game Design & Development | 3 | VGD 271 No Equivalent | Introduction to 3D Design No Equivalent | 4 No Equivalent |
| DAGD 255 | Game Design Programming 1 | 3 | No Equivalent | No Equivalent | No Equivalent |
| DAGD 300 | Game Design & Theory | 3 | No Equivalent | No Equivalent | No Equivalent |
| DAGD 355 | Game Design Programming 2 | 3 | No Equivalent | No Equivalent | No Equivalent |

**OR**

**Machine Learning Engineering**

| FSU Course | FSU Course Title | FSU Cr. Hrs. | WCCCD Equiv. | WCCCD Course Title | WCCCD Cr. Hrs. |
|---|---|---|---|---|---|
| SENG 309 | Introduction to Machine Learning (SENG 300) | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 409 | Applied Machine Learning in Software as a Service Environments | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 410 | Introduction to Big Data Concepts & Tools | 3 | No Equivalent | No Equivalent | No Equivalent |
| SENG 422 | Introduction to Cloud Application Development | 3 | No Equivalent | No Equivalent | No Equivalent |

| **Total Credits Required for Degree** | **125 - 126** |
|---|---|

## Program Delivery Locations and Contact Information:
**Main Campus, Big Rapids**
**College of Education and Human Services**
 (231) 591-3646 | College of Education and Human Services Website
**Ferris Statewide – Grand Rapids**
(810) 762-0461 | Ferris Grand Rapids Website | Ferris Grand Rapids Email
Transfer Partnerships Website

Select courses may be delivered online and/or in a mixed delivery format (i.e. a mix of online and face-to-face instruction at the Ferris Main Campus or at an off-campus location).

**General Admission Criteria**
**Transfer Students**
- 2.0 cumulative GPA (on a 4.0 scale)
- Minimum of 12 credits

**Advising Notes**
It is recommended that potential applicants meet with an advisor to review the degree, course schedule, and have any questions answered prior to completing an application. Students who are completing the MTA may have different general education course requirements for the particular degree selected. Meeting with a Ferris advisor prior to the selection of general education or elective course work may reduce the chance of completing a course that will not apply toward the selected degree. Once admitted, students must continue to meet with an advisor as they work toward graduation.

**Transfer Student Orientation**
All new students to Ferris State University are required to complete an orientation.

**Online Learning**
Select courses delivered online and/or in a mixed delivery format (i.e. a mix of online and face-to-face instruction at the Ferris Main Campus or at an off-campus location). The "Online Readiness Tutorial" is required for students who register for an online *course* or are completing an online *degree*. Students must demonstrate competency in Blackboard skills. This may be done by taking a tutorial and quiz, or, for students who have already taken and passed online courses, they can submit a waiver request. Students should check with the department that offers the class to determine its particular needs and/or the Ferris advisor regarding registration for online course work.

**Reverse Transfer Agreement**
The Community College and Ferris have entered into a partnership in order to work collaboratively and creatively to increase student completion of associate and bachelor degrees. The partners work together to provide a seamless transfer experience and increase student retention and completion at both the community college and Ferris.

**Michigan Transfer Agreement (MTA)**
Ferris participates in the Michigan Transfer Agreement (MTA). This agreement will facilitate the transfer of general education requirements from one Michigan institution to another. Students may complete the MTA as part of a degree program or as a stand-alone package. The MTA consists of a minimum of 30 general education credit hours as identified by the college or university.

Students transferring to Ferris with the Michigan Transfer Agreement (MTA) and entering a degree program will have met a 30-hour block of lower-level general education courses. However, this does not exempt students from completing program specific prerequisites or higher-level general education course requirements. Students should contact their advisor regarding classes that meet the MTA.

Students must work with their Ferris advisor to declare a Minor or Concentration and for selection of Directed Electives.

**Disclaimer**
This is a guide for students who plan to transfer to Ferris State University. This guide is not intended to be a contract with Ferris. The information on this guide is subject to change. Students should contact their community college or Ferris to keep informed of changes. Final responsibility for verifying all transfer information lies with the student. Please refer to effective and/or revised date on the bottom of this guide.