

# Software Engineering

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## Department Information

- **Department Chair:**  
Simone Ludwig, Ph.D.
- **Program Coordinator:**  
Saeed Salem, Ph.D.
- **Department Location:**  
258 QBB
- **Department Phone:**  
(701) 231-8562
- **Department Email:**  
gradinfo@cs.ndsu.edu
- **Department Web Site:**  
ndsu.edu/cs/ (<http://ndsu.edu/cs/>)
- **Application Deadline:**  
February 1 for fall admission; September 1 for spring admission\* No summer admission for any Software Engineering Program
- **Credential Offered:**  
Ph.D., M.S., M.S.E, Certificate
- **Test Requirement:**  
GRE - M.S. and Ph.D. applicants (waived for fall 2022 applicants)
- **English Proficiency Requirements:**  
TOEFL ibt 79; IELTS 6.5; Duolingo 105

## Graduate Certificate

Code	Title	Credits
CSCI 713	Software Development Processes	3
<b>Select two of the following:</b>		<b>6</b>
CSCI 714	Software Project Planning and Estimation	
CSCI 715	Software Requirements Definition and Analysis	
CSCI 716	Software Design	
CSCI 717	Software Construction	
CSCI 718	Software Testing and Debugging	
CSCI 848	Empirical Methods in Software Engineering	3
<b>Total Credits</b>		<b>12</b>

## Masters of Software Engineering

Code	Title	Credits
<b>Core Courses - 15 Credits</b>		
CSCI 713	Software Development Processes	
CSCI 715	Software Requirements Definition and Analysis	
CSCI 716	Software Design	
CSCI 718	Software Testing and Debugging	
CSCI 848	Empirical Methods in Software Engineering	
<b>Electives - 15 Credits</b>		
CSCI 714	Software Project Planning and Estimation	
CSCI 717	Software Construction	
CSCI 724	Survey of Artificial Intelligence	
CSCI 736	Advanced Intelligent Systems	

CSCI 765	Introduction To Database Systems	
CSCI 834	Knowledge Based Systems	
CSCI 846	Development of Distributed Systems	
CSCI 847	Software Complexity Metrics	
<b>Total Credits - 30</b>		

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## Master of Science

Code	Title	Credits
<b>Core Courses</b>		<b>12</b>
CSCI 713	Software Development Processes	
CSCI 715	Software Requirements Definition and Analysis	
or CSCI 718	Software Testing and Debugging	
CSCI 716	Software Design	
CSCI 765	Introduction To Database Systems	
<b>Six credits (not part of the core) from:</b>		<b>6</b>
CSCI 714	Software Project Planning and Estimation	
CSCI 715	Software Requirements Definition and Analysis	
CSCI 717	Software Construction	
CSCI 718	Software Testing and Debugging	
CSCI 845	Formal Methods for Software Development	
CSCI 846	Development of Distributed Systems	
CSCI 847	Software Complexity Metrics	
CSCI 848	Empirical Methods in Software Engineering	
CSCI 790	Graduate Seminar	3
<b>Plan A: Master's Thesis</b>		
Other Computer Science or Software Engineering Courses		3-6
CSCI 798	Master's Thesis	6-9
<b>Plan B: Master's Paper</b>		
Other Computer Science or Software Engineering Courses		9
CSCI 797	Master's Paper	3
<b>Total Credits</b>		<b>33</b>

Code	Title	Credits
<b>Students seeking an option in cybersecurity must take 9 credits from the below list.</b>		<b>9</b>
CSCI 601		
CSCI 602		
CSCI 603	Defensive Network Security	
CSCI 604	Ethical Hacking	
CSCI 605		
CSCI 606		
CSCI 607		
CSCI 608		
CSCI 609	Cybersecurity Law and Policy	
CSCI 610	Computer Crime and Forensics	
CSCI 669	Network Security	
CSCI 773	Foundations of the Digital Enterprise	

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## Doctor of Philosophy

### Bachelor's to Doctor of Philosophy in Software Engineering degree requirements

Code	Title	Credits
Select 5 from the courses listed below:		15
CSCI 713	Software Development Processes	
CSCI 714	Software Project Planning and Estimation	
CSCI 715	Software Requirements Definition and Analysis	
CSCI 716	Software Design	
CSCI 717	Software Construction	
CSCI 718	Software Testing and Debugging	
CSCI 845	Formal Methods for Software Development	
CSCI 846	Development of Distributed Systems	
CSCI 847	Software Complexity Metrics	
CSCI 848	Empirical Methods in Software Engineering	
CSCI 790	Graduate Seminar	3
Courses in Software Engineering approved by the student's Supervisory Committee.		21-36
CSCI 899	Doctoral Dissertation	36-51
Total Credits		90

### Master's to Doctor of Philosophy in Software Engineering degree requirements

Code	Title	Credits
Select 5 from the courses listed below:		15
CSCI 713	Software Development Processes	
CSCI 714	Software Project Planning and Estimation	
CSCI 715	Software Requirements Definition and Analysis	
CSCI 716	Software Design	
CSCI 717	Software Construction	
CSCI 718	Software Testing and Debugging	
CSCI 845	Formal Methods for Software Development	
CSCI 846	Development of Distributed Systems	
CSCI 847	Software Complexity Metrics	
CSCI 848	Empirical Methods in Software Engineering	
CSCI 790	Graduate Seminar	3
Courses in Software Engineering approved by the student's Supervisory Committee.		6-12
CSCI 899	Doctoral Dissertation	30-36
Total Credits		60

### Students seeking an option in cybersecurity must take 9 credits from the below list.

Code	Title	Credits
Courses numbered CSCI 601-610		
and		
CSCI 669	Network Security	
CSCI 773	Foundations of the Digital Enterprise	

- A minimum of 15 didactic credits numbered 700-789 and/or 800-898.
- Students who applied the listed core courses towards a MS degree obtained from NDSU can take up to 42 research credits.
- Research adviser should be selected by the second semester at NDSU.
- A Plan of Study listing coursework and examination committee members should be completed by the end of the second semester at NDSU.
- Satisfactory completion of the Comprehensive Exam at the PhD level (written exam based on the core courses).

- Research proposal presentation and preliminary oral examination (Qualifying Exam) should be completed by the fourth semester at NDSU after passing the Comprehensive Exam.
- Final Oral Examination on the PhD dissertation.