

Computational Science Engineering (CSE) Certificate Program

Course Requirements Worksheet

Use this worksheet to record your certificate coursework.

Name _____ UT EID _____

1. Upper Division Mathematics

(choose 1 course, 3-4 credits)

<i>Crs #</i>	<i>Course Title</i>	<i>Semester taken</i>	<i>Grade</i>
M 340L	Matrices and Matrix Calculations	_____	_____
M 341	Linear Algebra and Matrix Theory	_____	_____
M 427J	Differential Equations with Linear Algebra	_____	_____
M 427K	Advanced Calculus for Applications I	_____	_____
M 427L	Advanced Calculus for Applications II	_____	_____
SDS 329C	Practical Linear Algebra I	_____	_____

2. Basic Programming

(choose 1 course, 1-3 credits)

<i>Crs #</i>	<i>Course Title</i>	<i>Semester taken</i>	<i>Grade</i>
ASE 301	Introduction to Computer Programming	_____	_____
BME 303	Introduction to Computing	_____	_____
CHE 210	Introduction to Computing	_____	_____
C E 311K	Introduction to Computer Methods	_____	_____
C S 303E	Elements of Computers and Programming	_____	_____
C S 313E	Elements of Software Design	_____	_____
C S 104C	Competitive Programming	_____	_____
C S 105	Computer Programming (<i>course discontinued Fall 2016</i>)	_____	_____
C S 105C	Computer Programming: C++	_____	_____
E E 312	Software Design and Implementation I	_____	_____
GEO 325J	Programming in FORTRAN and MATLAB	_____	_____
MIS 304	Introduction to Problem Solving and Programming	_____	_____
M E 205	Introduction to Computers and Programming	_____	_____
SDS 222	Introduction to Scientific Programming	_____	_____
SDS 322	Introduction to Scientific Programming	_____	_____

(Any course from Electives list or any other basic programming course approved by Certificate Adviser)

3. Numerical Applications

(choose 1 course, 1-3 credits)

<i>Crs #</i>	<i>Course Title</i>	<i>Semester taken</i>	<i>Grade</i>
ARE 372	Modeling of Air and Pollutant Flows in Buildings	_____	_____
ASE 211K	Engineering Computation	_____	_____
ASE 311	Engineering Computation (<i>course discontinued Fall 2014</i>)	_____	_____
ASE 321K	Comput'l Meths for Structural Anly (<i>crs renamed COE 321K Spr 17</i>)	_____	_____
ASE 347	Intro to Computational Fluid Dynamics (<i>crs renamed COE 347</i>)	_____	_____
ASE 372N	Satellite-Based Navigation	_____	_____

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3. Numerical Applications (cont'd)			
<i>Crs #</i>	<i>Course Title</i>	<i>Semester taken</i>	<i>Grade</i>
BCH 339N	Systems Biology and Bioinformatics	_____	_____
BIO 321G	Principles of Computational Biology	_____	_____
BIO 337J	Computational Biology Laboratory	_____	_____
BME 313	Num Meths/Modlng Biomed Engr <i>(course discontinued Fall 2015)</i>	_____	_____
BME 113L	Intro Num Meth in Biomed Engr <i>(course discontinued Fall 2016)</i>	_____	_____
BME 313L	Intro to Numerical Methods in Biomedical Engineering	_____	_____
BME 342	Biomechanics of Human Movement	_____	_____
BME 345	Graphics and Visualization Laboratory	_____	_____
BME 346	Computational Biomolecular Engineering	_____	_____
BME 377T	Computational Methods for Biomedical Engineers	_____	_____
CH 369K	Techn of Research-FRI <i>(MUST be course on Computational Materials)</i>	_____	_____
CHE 348	Numerical Methods in Chem Engineering & Problem Solving	_____	_____
CHE 356	Optimization: Theory and Practice	_____	_____
COE 211K	Engineering Computation	_____	_____
COE 321K	Comput'l Meths for Structural Anly <i>(formerly ASE 321K)</i>	_____	_____
COE 347	Introduction to Computational Fluid Dynamics <i>(formerly ASE 347)</i>	_____	_____
CSE 397	Computational Modeling in Bioengineering and Medicine	_____	_____
CSE 397	Introduction to Computational Oncology	_____	_____
ECO 363C	Computational Economics	_____	_____
ECO 441K	Introduction to Econometrics	_____	_____
E E 313	Linear Systems and Signals	_____	_____
E E 385V	Topic: Computational Neuroscience	_____	_____
E M 360	Topic 13: Applications of Finite Element Methods	_____	_____
E M 394F	Finite Element Methods	_____	_____
GEO 325G	Computational Applications in the Geosciences	_____	_____
GEO 325K	Computational Methods	_____	_____
GEO 347G	Climate System Modeling	_____	_____
M 374M	Mathematical Modeling in Science and Engineering	_____	_____
M E 218	Engineering Computational Methods	_____	_____
M E 318M	Programming and Engineering Computational Methods	_____	_____
M E 365K	Finite Element Method	_____	_____
M E 367S	Simulation Modeling	_____	_____
M E 369L	Introduction to Computational Fluid Dynamics	_____	_____
NEU 337	Topic: Computational Neuroscience	_____	_____
PGE 310	Formulation & Solution of Geosystems Engr Problems	_____	_____
PGE 323M	Reservoir Engineering III	_____	_____
PHY 329	Introduction to Computational Physics	_____	_____
SDS 339	Applied Computational Science	_____	_____
STA 372	Topic: Quant Fin: Model, Tools & Applics	_____	_____
STA 372	Topic 6: Optimization Methods in Finance	_____	_____
STA 372	Topic 7: Computational Finance	_____	_____

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4. Advanced Computing

(choose 1 course, 3 credits)

<i>Crs #</i>	<i>Course Title</i>	<i>Semester taken</i>	<i>Grade</i>
ASE 321K	Comput'l Meths for Structural Anly (<i>crs renamed COE 321K Spr 17</i>)	_____	_____
ASE 347	Intro to Computational Fluid Dynamics (<i>crs renamed COE 347</i>)	_____	_____
CH 354M	Intro to Computational Methods in Chemistry	_____	_____
COE 321K	Comput'l Meths for Structural Anly (<i>formerly ASE 321K</i>)	_____	_____
COE 347	Introduction to Computational Fluid Dynamics (<i>formerly ASE 347</i>)	_____	_____
C S 323E	Elements of Scientific Computing	_____	_____
C S 323H	Elements of Scientific Computing: Honors	_____	_____
C S 354	Computer Graphics	_____	_____
C S 367	Numerical Methods	_____	_____
C S 377	Principles and Applications of Parallel Programming	_____	_____
C S 378	Topic: Programming for Correctness and Performance	_____	_____
E E 360F	Introduction to Software Engineering	_____	_____
E E 360P	Concurrent and Distributed Systems	_____	_____
E E 379K	Engineering Programming Languages	_____	_____
E E 380L	Topic 5: Engineering Programming Languages	_____	_____
E E 382V	Topic: Advanced Programming Tools	_____	_____
E E 422C	Software Design & Implementation II	_____	_____
M 348	Scientific Computation in Numerical Analysis	_____	_____
M 368K	Numerical Methods for Applications	_____	_____
M E 369P	Application Programming for Engineers	_____	_____
PGE 379	Topic: High Performance Computing for Engineers	_____	_____
SDS 335	Scientific & Technical Computing	_____	_____
SDS 374C	Parallel Computing for Science and Engineering	_____	_____
SDS 374D	Distributed & Grid Computing for Science & Engineering	_____	_____
SDS 374E	Visualization & Data Analysis for Science & Engineering	_____	_____
SDS 375	Topic: Programming for Correctness	_____	_____

5. Electives

(choose ≥ 1 course, ≥ 3 credits)

<i>Crs #</i>	<i>Course Title</i>	<i>Semester taken</i>	<i>Grade</i>
ASE 330M	Linear System Analysis	_____	_____
CSE 380	Tools and Techniques of Computational Science	_____	_____
CSE 383C	Numerical Analysis: Linear Algebra	_____	_____
CSE 383K	Numerical Analysis: Algebra and Approximation	_____	_____
CSE 386C	Methods of Applied Mathematics	_____	_____
CSE 386M	Functional Analysis in Theoretical Mechanics	_____	_____
CSE 393F	Finite Element Methods	_____	_____
CSE 393N	Numerical Methods for Flow and Transport Problems	_____	_____
C S 329E	Topic: Elements of Data Visualization	_____	_____
C S 337	Theory in Programming Practice	_____	_____
C S 337H	Theory in Programming Practice: Honors	_____	_____

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5. Electives (cont'd)			
<i>Crs #</i>	<i>Course Title</i>	<i>Semester taken</i>	<i>Grade</i>
C S 363D	Introduction to Data Mining	_____	_____
C S 373	Software Engineering	_____	_____
E E 360C	Algorithms	_____	_____
E E 380L	Topic 10: Data Mining	_____	_____
E E 461L	Software Engineering and Design Laboratory	_____	_____
GEO 366M	Mathematical Methods in Geophysics	_____	_____
M 346	Applied Linear Algebra	_____	_____
M 372K	Partial Differential Equations and Applications	_____	_____
M 376C	Methods of Applied Mathematics	_____	_____
M E 350R	Robot Mechanism Design	_____	_____
M E 372J	Robotics and Automation	_____	_____
MIS 373	Topic 17: Predictive Analytics and Data Mining	_____	_____
NEU 366M	Quantitative Methods in Neuroscience	_____	_____
SDS 348	Computational Biology and Bioinformatics	_____	_____
SDS 394	Scientific and Technical Computing	_____	_____
SDS 394C	Parallel Computing for Scientists and Engineers	_____	_____
SDS 394D	Distributed and Grid Computing for Scientists & Engineers	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
(Any additional course from Numerical Applications (#3), Advanced Computing (#4), or any graduate level scientific computing course approved by Certificate Adviser)			

6. Scientific Computing Project			
(choose 1 course, 3 credits)		Faculty Supervisor: _____	
<i>Crs #</i>	<i>Course Title</i>	<i>Semester taken</i>	
CSE 370	Individual Reading and Research	_____	_____
CSE 390	Individual Research (graduate level crs, requires permission to enroll)	_____	_____
_____	_____	_____	_____
(Any 3 credit, advanced undergraduate level individual instruction course in a participating department)			