### Computer Game Science, B.S.  2013-14 Degree Requirements Checklist

- All students must meet the University Requirements.
- With the approval of the ICS Associate Dean for Student Affairs, a student may design a new track, or an Independent Study, Honors Research, or Special Topics course may be substituted for a course in a track.
- Computer Game Science (CGS) elective courses may not be counted as part of the Management minor or the Biomedical Computing minor.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Courses taken / taking</th>
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<tr>
<td>I&amp;C SCI 31 – Introduction to Programming</td>
<td>1)</td>
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<tr>
<td>I&amp;C SCI 32 – Programming with Software Libraries</td>
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<tr>
<td>I&amp;C SCI 33 – Intermediate Programming</td>
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<tr>
<td>I&amp;C SCI 45C – Programming in C++ as a Second Language</td>
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<td>I&amp;C SCI 46 – Data Structure Implementation and Analysis</td>
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<td>I&amp;C SCI 51 – Introductory Computer Organization</td>
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<tr>
<td>IN4MATX 43 OR I&amp;C SCI 52 – Introduction to Software Engineering</td>
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<tr>
<td>MATH 2A – Single-Variable Calculus</td>
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<tr>
<td>MATH 2B – Single-Variable Calculus</td>
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<tr>
<td>I&amp;C SCI 6B – Boolean Algebra and Logic</td>
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<td>I&amp;C SCI 6D – Discrete Mathematics for Computer Science</td>
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<tr>
<td>I&amp;C SCI 6N – Computational Linear Algebra OR MATH 3A – Linear Algebra</td>
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<tr>
<td>STATS 67 – Introduction to Probability and Statistics for Computer Science</td>
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<tr>
<td>I&amp;C SCI 60 – Computer Games and Society</td>
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<tr>
<td>I&amp;C SCI 61 – Games Systems and Design</td>
<td>1)</td>
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<td>I&amp;C SCI 62 – Game Technologies and Interactive Media</td>
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<td>PHYSICS 3A – Basic Physics</td>
<td>1)</td>
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<tr>
<td>FLM&amp;MDA 85A – Introduction to Film and Visual Analysis</td>
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<tr>
<td>I&amp;C SCI 160 – Graphics Processors and Game Platforms</td>
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<tr>
<td>I&amp;C SCI 161 – Game Engine Lab</td>
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<tr>
<td>I&amp;C SCI 167 – Multiplayer Game Systems</td>
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<td>I&amp;C SCI 168 – Multiplayer Game Project</td>
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<tr>
<td>I&amp;C SCI 169A – Capstone Game Project I</td>
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<tr>
<td>I&amp;C SCI 169B – Capstone Game Project II</td>
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<tr>
<td>Two courses from: I&amp;C SCI 162, I&amp;C SCI 163, I&amp;C SCI 166</td>
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<tr>
<td>COMPSCI 112 – Computer Graphics</td>
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<tr>
<td>COMPSCI 171 – Introduction to Artificial Intelligence</td>
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<tr>
<td>One course from: COMPSCI 122A, IN4MATX 113, IN4MATX 121, IN4MATX 131</td>
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<tr>
<td>Five additional elective courses</td>
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At least three upper-division courses must be taken within the same Bren ICS track (see reverse)
### BREN ICS TRACKS

**Algorithms**
- COMPSCI 161 – Design and Analysis of Algorithms
- COMPSCI 162 – Formal Languages and Automata
- COMPSCI 163 – Graph Algorithms
- COMPSCI 164 – Computational Geometry and Geometric Modeling
- COMPSCI 165 – Project In Algorithms And Data Structures

**Artificial Intelligence**
- COMPSCI 171 – Introduction to Artificial Intelligence
- COMPSCI 174 – Bioinformatics
- COMPSCI 175 – Project in Artificial Intelligence
- COMPSCI 177 – Applications of Probability in Computer Science
- COMPSCI 178 – Machine Learning and Data-Mining
- COMPSCI 179 – Algorithms for Probabilistic and Deterministic Graphical Models

**Computational Biology**
- COMPSCI 183 – Introduction to Computational Biology
- COMPSCI 184A – Representations and Algorithms for Molecular Biology
- COMPSCI 184B – Probabilistic Modeling of Biological Data
- COMPSCI 184C – Computational Systems Biology

**Computer Graphics and Vision**
- COMPSCI 111 – Digital Image Processing
- COMPSCI 112 – Computer Graphics
- COMPSCI 114 – Projects in Advanced 3D Computer Graphics
- COMPSCI 116 – Computational Photography and Vision
- COMPSCI 117 – Project in Computer Vision

**Computer Networks**
- COMPSCI 131 – Parallel and Distributed Computing
- COMPSCI 132 – Computer Networks
- COMPSCI 133 – Advanced Computer Networks
- COMPSCI 134 – Computer and Network Security
- COMPSCI 137/IN4MATX 124 – Internet Applications Engineering

**Databases**
- COMPSCI 121/IN4MATX 141 – Information Retrieval
- COMPSCI 122A – Introduction to Data Management
- COMPSCI 122B – Project in Databases and Web Applications
- COMPSCI 125 – Next Generation Search Systems

**Hardware**
- COMPSCI 145A – Embedded Computing Systems
- COMPSCI 151 – Digital Logic Design
- COMPSCI 153 – Logic Design Laboratory
- COMPSCI 154 – Computer Design Laboratory

**Human-Computer Interaction**
- IN4MATX 131 – Human Computer Interaction
- IN4MATX 132 – Project in Human-Computer Interaction Requirements and Evaluation
- IN4MATX 133 – User Interaction Software
- IN4MATX 134 – Project in User Interaction Software

**Operating Systems**
- COMPSCI 143A – Principles of Operating Systems
- COMPSCI 143B – Project in Operating System Organization
- COMPSCI 144 – High-performance Computers and Program Optimization
- COMPSCI 146 – Programming in Multitasking Operating Systems

**Programming Languages and Compilers**
- IN4MATX 101/COMPSCI 141 – Concepts in Programming Languages I
- IN4MATX 102 – Concepts of Programming Language II
- COMPSCI 142A – Compilers and Interpreters
- COMPSCI 142B – Language Processor Construction

**Project Management**
- IN4MATX 151 – Project Management
- IN4MATX 161 – Social Analysis of Computerization
- IN4MATX 162W – Organizational Information Systems

**Simulation and Optimization**
- COMPSCI 115 – Computer Simulation
- COMPSCI 168 – Network Optimization
- COMPSCI 169 – Introduction to Optimization

**Social Impacts of Computing**
- IN4MATX 161 – Social Analysis of Computerization
- IN4MATX 162W – Organizational Information Systems
- IN4MATX 163 – Project in the Social and Organizational Impacts of Computing

**Software Design**
- IN4MATX 121 – Software Design I
- IN4MATX 122 – Software Design II
- IN4MATX 123 – Software Architecture

**Software Engineering**
- IN4MATX 113 – Requirements Analysis and Engineering
- IN4MATX 115 – Software Testing, Analysis, and Quality Assurance
- IN4MATX 124/COMPSCI 137 – Internet Applications Engineering