Business education – course code 034401
The curriculum used must incorporate the following standards to qualify as Computer Science II credit.
<table>
<thead>
<tr>
<th>Concept</th>
<th>Subconcept</th>
<th>Standard</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Computing Systems</strong></td>
<td>Devices</td>
<td>11-12.CS.D.01</td>
<td>Illustrate ways computing systems implement logic through hardware components.</td>
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<td></td>
<td>Hardware &amp; Software</td>
<td>11-12.CS.HS.01</td>
<td>Describe and categorize roles of an operating system.</td>
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<td></td>
<td>Troubleshooting</td>
<td>11-12.CS.T.01</td>
<td>Describe how hardware components facilitate logic, input, output and storage in computing systems.</td>
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<tr>
<td><strong>Networks &amp; the Internet</strong></td>
<td>Network Communication &amp; Organization</td>
<td>11-12.NI.NCO.01</td>
<td>Analyze the relationship between routers, switches, servers, topology and addressing.</td>
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<td>11-12.NI.NCO.02</td>
<td>Describe key protocols and underlying processes of internet-based services (e.g., http/https and Simple Mail Transfer Protocol (SMTP)/internet Message Access Protocol (IMAP), routing protocols).</td>
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<td>11-12.NI.NCO.03</td>
<td>Explain how the characteristics of the internet influence the systems developed on it.</td>
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<td>Cybersecurity</td>
<td>11-12.NI.C.01</td>
<td>Compare and refine ways in which software developers protect devices and information from unauthorized access.</td>
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<td></td>
<td></td>
<td>11-12.NI.C.02</td>
<td>Analyze cryptographic techniques to model the secure transmission of information.</td>
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<tr>
<td><strong>Data &amp; Analysis</strong></td>
<td>Storage</td>
<td>11-12.DA.S.01</td>
<td>Compare different bit representations of data types, such as characters, Booleans and numbers while recognizing when using each data type is appropriate.</td>
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<td></td>
<td>Collection, Visualization &amp; Transformation</td>
<td>11-12.DA.CVT.01</td>
<td>Generate data sets that use a variety of data collection tools and analysis techniques to support a claim and/or communicate information.</td>
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<td>Inference &amp; Models</td>
<td>11-12.DA.IM.01</td>
<td>Evaluate the ability of models and simulations to test and support the refinement of hypotheses.</td>
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<tr>
<td><strong>Algorithms &amp; Programming</strong></td>
<td>Algorithms</td>
<td>11-12.AP.A.01</td>
<td>Critically examine and trace classic algorithms (e.g., selection sort, insertion sort, binary search, linear search).</td>
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<td>11-12.AP.A.02</td>
<td>Implement an artificial intelligence algorithm to interact with a human or solve a problem.</td>
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<td>11-12.AP.A.03</td>
<td>Describe how artificial intelligence algorithms drive many software and physical systems (e.g., autonomous robots, computer vision, pattern recognition, text analysis).</td>
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<td>11-12.AP.A.04</td>
<td>Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency and clarity.</td>
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<td>Variables</td>
<td>11-12.AP.V.01</td>
<td>Create problem solutions that utilize data structures (e.g., lists, arrays, ArrayLists).</td>
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<td>Control</td>
<td>11-12.AP.C.01</td>
<td>Trace the execution of iteration (e.g., loops, recursion), illustrating output and changes in values of named variables.</td>
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<td>Modularity</td>
<td>11-12.AP.M.01</td>
<td>Construct solutions to problems using student-created components (e.g., procedures, modules, objects).</td>
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<td>11-12.AP.M.02</td>
<td>Create programming solutions by reusing existing code (e.g., libraries, Application Programming Interface (APIs), code repositories).</td>
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<td>11-12.AP.M.03</td>
<td>Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution.</td>
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<td>Program Development</td>
<td>11-12.AP.PD.01</td>
<td>Use integrated development environments (IDEs) and collaborative tools and practices (code documentation) in a software project.</td>
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<tr>
<td>Algorithms &amp; Programming</td>
<td>Standards</td>
<td>Description</td>
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<tr>
<td>Program Development</td>
<td>11-12.AP.PD.02</td>
<td>Plan and develop programs using a development process (e.g., waterfall, iterative, spiral, rapid application development, agile).</td>
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<td>11-12.AP.PD.03</td>
<td>Identify and compare features of various programming languages that make them useful for solving problems and developing systems.</td>
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<td>11-12.AP.PD.04</td>
<td>Design software using version control.</td>
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<td>11-12.AP.PD.05</td>
<td>Develop and use a series of test cases to verify that a program performs according to its design specifications.</td>
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<td>11-12.AP.PD.06</td>
<td>Explain security issues that might lead to compromised computer programs.</td>
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<td>11-12.AP.PD.07</td>
<td>Evaluate key qualities of a program through a process such as a code review.</td>
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<td>Impacts of Computing</td>
<td>11-12.IC.C.01</td>
<td>Evaluate the impact of equity, access and influence on the distribution of computing resources in a global society.</td>
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<td>Safety, Laws &amp; Ethics</td>
<td>11-12.IC.SLE.01</td>
<td>Debate laws and regulations that impact the development and use of software.</td>
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**References:**