Science and Mathematics G.A.
Career Community: Science and Mathematics
Curriculum Code: 1831
Effective: Fall 2023 – Summer 2028

Purpose of Major
This degree is designed for students interested in pursuing a career in mathematics, engineering, or a broad range of scientific fields. This Career Community includes the following pathways: Biology, Biotechnology, Chemical Technology, Chemistry, Computer Science, Conservation and Sustainability, Engineering-Physics, Geography, Geology, and Mathematics. The degree includes a common set of courses applicable to the Science and Mathematics majors listed above and to many transfer institutions. Students beginning college in this degree program are encouraged to work with academic and program advisors throughout their first few semesters of study to determine their specific major area and, if transfer is a goal, the specific requirements of the transfer institution.

Not all courses in this pathway transfer to all colleges.

Milestone
In addition to the required General Education courses in Math and English, completion of CHEM 151 and CHEM 161 with a 2.0 or higher, is a key component for success in completing this program. Knowledge obtained in these courses is the foundation for learning in other required courses. Students are encouraged to contact their faculty if they need additional assistance with learning the concepts presented in this course.

Contact Information
For further information, including career options, course substitutions and waivers, etc., contact the Science and Mathematics Department, Arts and Sciences Building, Room 3203, telephone number 517-483-1092.

General Education – Applied Degrees - Recommended Courses
Select courses as indicated for specific transfer institutions and majors. These courses are preferred General Education courses listed on Transfer Articulation agreements. The recommended courses in each General Education category also meet Michigan Transfer Agreement (MTA) requirements. If no course is indicated, choose from the list of options under General Education. A minimum grade of 2.0 is required for each General Education course.

- English Composition or Applied English
Science and Mathematics Career Community Courses meet this requirement.

- English Composition (second course)/Communication or Applied Communication
Science and Mathematics Career Community Courses meet this requirement.
- Humanities and Fine Arts or Social Sciences or Applied Social Sciences Science and Mathematics Career Community courses meet this requirement.

- Mathematics or Applied Mathematics Science and Mathematics Career Community Courses meet this requirement.

- Natural Sciences Lab or Applied Sciences and Technology Lab Science and Mathematics Career Community Courses meet this requirement.

**Science and Mathematics Career Community Courses** – *These courses are required for all Science and Mathematics programs. They should be taken before other Program Required or Limited Choice Courses. Some courses meet General Education requirements for Michigan Transfer Agreement (MTA). A minimum of 2.0 is required to meet LCC degree requirements for General Education courses and for all courses to transfer to other colleges (some colleges, and some programs within colleges, require a higher grade in a course.)*

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credit / Billing Hours</th>
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<tbody>
<tr>
<td>ACAD 100</td>
<td>First-Year Experience</td>
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<tr>
<td>ANTH 270 or</td>
<td>Cultural Anthropology</td>
<td>3 / 3</td>
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<tr>
<td>ECON 120 or</td>
<td>Power, Authority and Exchange</td>
<td>4 / 4</td>
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<tr>
<td>ECON 201 or</td>
<td>Principles of Economics-Micro</td>
<td>4 / 4</td>
</tr>
<tr>
<td>EDUC 204 or</td>
<td>Educational Psychology</td>
<td>3 / 3</td>
</tr>
<tr>
<td>EDUC 220 or</td>
<td>Introduction to Education</td>
<td>3 / 3</td>
</tr>
<tr>
<td>GEOG 120 or</td>
<td>Introduction to Geography</td>
<td>3 / 3</td>
</tr>
<tr>
<td>GEOG 200 or</td>
<td>World Regional Geography</td>
<td>4 / 4</td>
</tr>
<tr>
<td>POLS 120 or</td>
<td>American Political System</td>
<td>4 / 4</td>
</tr>
<tr>
<td>POLS 240 or</td>
<td>Introduction to Public Policy</td>
<td>3 / 3</td>
</tr>
<tr>
<td>POLS 260 or</td>
<td>Comparative Political Systems</td>
<td>3 / 3</td>
</tr>
<tr>
<td>PSYC 200 or</td>
<td>Introduction to Psychology</td>
<td>4 / 4</td>
</tr>
<tr>
<td>SOCL 120</td>
<td>Introduction to Sociology</td>
<td>4 / 4</td>
</tr>
<tr>
<td>BIOL 120 or</td>
<td>Environmental Science</td>
<td>4 / 6</td>
</tr>
<tr>
<td>BIOL 127 or</td>
<td>Cell Biology</td>
<td>4 / 6</td>
</tr>
<tr>
<td>GEOL 221 or</td>
<td>Physical Geology</td>
<td>4 / 6</td>
</tr>
<tr>
<td>GEOL 230 or</td>
<td>Environmental Geology</td>
<td>4 / 6</td>
</tr>
<tr>
<td>PHYS 251</td>
<td>Physics I with Calculus</td>
<td>5 / 7</td>
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<tr>
<td>CHEM 151</td>
<td>General Chemistry Lecture I</td>
<td>4 / 4</td>
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<tr>
<td>CHEM 161</td>
<td>General Chemistry Lab I</td>
<td>1 / 3</td>
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<tr>
<td>COMM 120 or</td>
<td>Dynamics of Communication</td>
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<tr>
<td>COMM 130 or</td>
<td>Fundamentals Public Speaking</td>
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<tr>
<td>ENGL 122 or</td>
<td>Composition II</td>
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<tr>
<td>ENGL 132</td>
<td>Honors Composition II</td>
<td>4 / 4</td>
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<tr>
<td>ENGL 121 or</td>
<td>Composition I</td>
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<tr>
<td>ENGL 131</td>
<td>Honors Composition I</td>
<td>4 / 4</td>
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</table>
Notes:
ACAD 100 may be waived when students meet one of the following College-approved waiver criteria:
- Completion of 12 college-level credits with minimum grades of 2.0 shown on the LCC transcript (including transfer, if applicable), or
- Employment in the field of, or a field related to, the degree being sought, or
- For Health Careers students, successful completion of CHSE 100.

In addition to CHEM 151 and CHEM 161, select Science courses as follows:
- Students interested in Biology, Biotechnology, Chemical Technology, Chemistry, or Conservation and Sustainability choose BIOL 127.
- Students interested in Computer Science choose BIOL 120 or GEOL 221 or PHYS 251.
- Students interested in Engineering/Physics or Mathematics choose PHYS 251.
- Students interested in Geography or Geology choose GEOL 230.

Students considering adding Secondary Education Certification in Mathematics or Science in order to teach in Michigan Public Schools are strongly encouraged to select an EDUC course as listed below.

For future transfer (Secondary Education Certification) to:
- Central Michigan University, Ferris State University, or Michigan State University choose EDUC 204.
- Eastern Michigan University, Grand Valley State University, University of Michigan Flint, or Western Michigan University choose EDUC 220.

**Program of Study Required Courses – Limited Choices** - *Select between 32 to 37 credits to reach the minimum of 60 credits required for the degree. Work with an Academic Advisor or Program Advisor to select the most appropriate courses or to select a field-specific major or transfer major that meets your educational and career goals. Some courses meet General Education requirements for Michigan Transfer Agreement (MTA). A minimum of 2.0 is required to transfer to other colleges (some colleges, and some programs within colleges, require a higher grade in a course.)*
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit / Billing Hours</th>
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<tbody>
<tr>
<td>BIOL 127</td>
<td>Cell Biology</td>
<td>4 / 6</td>
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<tr>
<td>BIOL 128</td>
<td>Organismal Biology</td>
<td>4 / 6</td>
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<tr>
<td>BIOL 203</td>
<td>Microbiology</td>
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<tr>
<td>BIOL 204</td>
<td>Microbiology Laboratory</td>
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<tr>
<td>BIOL 210</td>
<td>Natural Resource Conservation</td>
<td>4 / 6</td>
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<tr>
<td>BIOL 260</td>
<td>Botany</td>
<td>4 / 6</td>
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<tr>
<td>BIOL 265</td>
<td>Zoology</td>
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<tr>
<td>BIOL 270</td>
<td>Human Genetics</td>
<td>3 / 3</td>
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<tr>
<td>BIOL 275</td>
<td>Molecular Biology I</td>
<td>4 / 6</td>
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<tr>
<td>BIOL 276</td>
<td>Molecular Biology II</td>
<td>4 / 6</td>
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<tr>
<td>CHEM 120</td>
<td>Gen Organic &amp; Biological Chem</td>
<td>4 / 4</td>
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<tr>
<td>CHEM 125</td>
<td>Basic Chemistry</td>
<td>4 / 4</td>
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<tr>
<td>CHEM 152</td>
<td>General Chemistry Lecture II</td>
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<tr>
<td>CHEM 162</td>
<td>General Chemistry Lab II</td>
<td>1 / 3</td>
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<tr>
<td>CHEM 182</td>
<td>Introductory Organic Chemistry</td>
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<tr>
<td>CHEM 192</td>
<td>Intro Organic Chem Lab</td>
<td>1 / 3</td>
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<td>CHEM 251</td>
<td>Organic Chemistry Lecture I</td>
<td>4 / 4</td>
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<td>CHEM 252</td>
<td>Organic Chemistry Lecture II</td>
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<tr>
<td>CHEM 262</td>
<td>Quantitative Analysis</td>
<td>3 / 6</td>
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<tr>
<td>CHEM 272</td>
<td>Organic Chemistry Laboratory</td>
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<tr>
<td>CITF 110</td>
<td>Intro Computer Info Systems</td>
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<td>CJUS 210</td>
<td>Intro to Forensic Science</td>
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<td>CPSC 101</td>
<td>Intro to Computer Science</td>
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<tr>
<td>COMM 240</td>
<td>Interpersonal Communication</td>
<td>3 / 3</td>
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<td>CPSC 131</td>
<td>Numerical Methods and MATLAB</td>
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<tr>
<td>CPSC 230</td>
<td>Algorithms and Computing w/ C++</td>
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<td>CPSC 231</td>
<td>Computing and Data Structures</td>
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<td>CPSC 260</td>
<td>Computing Science Structures</td>
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<td>ECON 120</td>
<td>Power, Authority and Exchange</td>
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<td>ECON 202</td>
<td>Principles of Economics-Macro</td>
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<td>ENGL 211</td>
<td>World Literature I</td>
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<td>ENGL 220</td>
<td>Science Fiction</td>
<td>4 / 4</td>
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<td>ENVR 121</td>
<td>Environmental Rules and Regs</td>
<td>3 / 3</td>
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<tr>
<td>ENVR 122</td>
<td>Enviro Sampl &amp; Instrumentation</td>
<td>4 / 6</td>
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<tr>
<td>ENVR 131</td>
<td>Industrial Process Safety</td>
<td>3 / 3</td>
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<tr>
<td>GEOG 120</td>
<td>Introduction to Geography</td>
<td>3 / 3</td>
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<td>GEOG 200</td>
<td>World Regional Geography</td>
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<tr>
<td>GEOG 202</td>
<td>Geography of North America</td>
<td>3 / 3</td>
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<tr>
<td>GEOG 220</td>
<td>Weather, Forecasting &amp; Climate</td>
<td>4 / 4</td>
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<tr>
<td>GEOG 221</td>
<td>Physical Geography</td>
<td>4 / 4</td>
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<td>GEOL 221</td>
<td>Physical Geology</td>
<td>4 / 6</td>
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<tr>
<td>GEOL 222</td>
<td>Historical Geology</td>
<td>4 / 6</td>
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<td>GEOL 230</td>
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<td>GSCI 100</td>
<td>Intro to Geospatial Tech</td>
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<td>GSCI 110</td>
<td>Beginning ArcGIS</td>
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<td>GSCI 120</td>
<td>Advanced ArcGIS</td>
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<td>GSCI 210</td>
<td>Global Positioning Systems</td>
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<td>GSCI 240</td>
<td>Cartography in GIS</td>
<td>3 / 4</td>
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<tr>
<td>GSCI 241</td>
<td>Remote Sens/AirPhoto Interpret</td>
<td>3 / 4</td>
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<tr>
<td>HIST 211</td>
<td>U.S. History to 1877</td>
<td>4 / 4</td>
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<tr>
<td>HIST 212</td>
<td>U.S. History: 1877 to Present</td>
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<tr>
<td>HUMS 160</td>
<td>Mythology</td>
<td>4 / 4</td>
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<tr>
<td>HUMS 223</td>
<td>The Western World to 1500</td>
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<tr>
<td>HUMS 224</td>
<td>The Western World since 1500</td>
<td>4 / 4</td>
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<tr>
<td>ISCI 121</td>
<td>Physical Science Concepts</td>
<td>4 / 6</td>
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<tr>
<td>ISCI 122</td>
<td>Integrated Sci for Education II</td>
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<tr>
<td>ISCI 131</td>
<td>Integrated Physical Science</td>
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<tr>
<td>ISCI 245</td>
<td>S.T.E.M. Workplace Practices</td>
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<tr>
<td>LING 230</td>
<td>Introduction to Linguistics</td>
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<tr>
<td>MATH 126</td>
<td>Precalculus</td>
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<tr>
<td>MATH 141</td>
<td>Calculus with Applications</td>
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<td>MATH 151</td>
<td>Calculus I</td>
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<td>MATH 152</td>
<td>Calculus II</td>
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<td>MATH 253</td>
<td>Calculus III</td>
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<td>MATH 254</td>
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<td>Linear Algebra</td>
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<td>MUSC 108</td>
<td>Concert Choir</td>
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<tr>
<td>MUSC 122</td>
<td>Rock Band</td>
<td>1 / 3</td>
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<tr>
<td>MUSC 123</td>
<td>Jazz Ensemble</td>
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<td>MUSC 124</td>
<td>Multi-Instrumental Music Ensem</td>
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<td>MUSC 240</td>
<td>Musical Cultures to 1750</td>
<td>4 / 4</td>
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<td>MUSC 241</td>
<td>Musical Cultures 1750-Present</td>
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<td>PHIL 151</td>
<td>Intro to Logic &amp; Critical Think</td>
<td>4 / 4</td>
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<td>PHIL 152</td>
<td>Introduction to Ethics</td>
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<tr>
<td>PHYS 120</td>
<td>The Art of Physics</td>
<td>4 / 5</td>
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<td>PHYS 200</td>
<td>Intro to Applied Physics</td>
<td>4 / 5</td>
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<td>PHYS 221</td>
<td>Introductory Physics I</td>
<td>4 / 6</td>
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<td>PHYS 251</td>
<td>Physics I with Calculus</td>
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<tr>
<td>PHYS 252</td>
<td>Physics II with Calculus</td>
<td>5 / 7</td>
</tr>
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<td>PHYS 260</td>
<td>Statics for Engineers</td>
<td>3 / 3</td>
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<td>POLS 120</td>
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<td>4 / 4</td>
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<tr>
<td>PSYC 200</td>
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<tr>
<td>RELG 150</td>
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<td>SCIN 287</td>
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<td>SOCL 120</td>
<td>Introduction to Sociology</td>
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<tr>
<td>STAT 170</td>
<td>Introduction to Statistics</td>
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</tr>
<tr>
<td>STAT 215</td>
<td>Intro to Probability and Stats</td>
<td>4 / 4</td>
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</tbody>
</table>

**Minimum Total Credit Hours**

60 credits / 64 billing hours

**Recommended Course Sequence**

**College-ready Full-time**

**Semester I**
- ACAD 100 (if waived, substitute Career Community course)
- ANTH 270 or ECON 120 or ECON 201 or EDUC 204 or EDUC 220 or GEOG 120 or GEOG 200 or POLS 120 or POLS 240 or POLS 260 or PSYC 200 or SOCL 120
- CHEM 151
- CHEM 161
- ENGL 121 or 131

**Semester II**
- BIOL 120 or BIOL 127 or GEOL 221 or GEOL 230 or PHYS 251
- COMM 120 or COMM 130 or ENGL 122 or ENGL 132
- MATH 120 or MATH 126 or MATH 151

Students who have decided on an academic program within the Science and Math Career Community should select that program through the Change of Program Request form and follow the coursework outlined for the associated pathway.

Limited Choice courses for students completing the Science and Math GA

**Semester III**

Limited Choice courses for students completing the Science and Math GA

**Semester IV**

Limited Choice courses for students completing the Science and Math GA

**College-ready Part-time**

**Semester I**
- ACAD 100 (if waived, substitute Career Community course)
- CHEM 151
- CHEM 161
- MATH 120 or MATH 126 or MATH 151
<table>
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<th>Semester II</th>
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<tbody>
<tr>
<td>ANTH 270 or ECON 120 or ECON 201 or EDUC 204 or EDUC 220 or GEOG 120 or GEOG 200 or POLS 120 or POLS 240 or POLS 260 or PSYC 200 or SOCL 120</td>
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<td>ENGL 121 or 131</td>
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<tr>
<th>Semester III (Summer – optional)</th>
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<td>BIOL 120 or BIOL 127 or GEOL 221 or GEOL 230 or PHYS 251</td>
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<tr>
<td>COMM 120 or COMM 130 or ENGL 122 or ENGL 132</td>
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</table>

Students who have decided on an academic program within the Science and Math Career Community should select that program through the Change of Program Request form and follow the coursework outlined for the associated pathway.

<table>
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<tr>
<th>Semester IV</th>
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<tr>
<td>BIOL 120 or BIOL 127 or GEOL 221 or GEOL 230 or PHYS 251 (if no Summer enrollment)</td>
</tr>
<tr>
<td>COMM 120 or COMM 130 or ENGL 122 or ENGL 132 (if no Summer enrollment)</td>
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Students who have decided on an academic program within the Science and Math Career Community should select that program through the Change of Program Request form and follow the coursework outlined for the associated pathway.

Limited Choice courses for students completing the Science and Math GA

<table>
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<tr>
<th>Semester V</th>
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<tbody>
<tr>
<td>Limited Choice courses for students completing the Science and Math GA</td>
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</tbody>
</table>

*LCC makes every effort to limit revisions to the pathways during their effective timeframe. However, the College reserves the right to update certificate and degree title changes, and make course changes as needed, without prior notice.*