

### 3-2 ENGINEERING SAMPLE COURSE SCHEDULE

#### Mathematics Major – Class of 2020 and later

Semester 1	Semester 2
Calculus 1 <sup>1</sup> (MATH 135 or equivalent)	Calculus 2 <sup>2</sup> (MATH 136 or equivalent)
Physics 1 (PHYS 115)	Physics 2 (PHYS 116)
Montserrat	Montserrat <sup>3</sup>
Common Area Requirement	Critical Reading and Writing <sup>4</sup>

Semester 3	Semester 4
Multivariable Calculus (MATH 241)	Computer Science (CSCI 131)
Algebraic Structures (MATH 243)	Linear Algebra (MATH 244)
Chemistry 1 (CHEM 181)	Common Area Requirement
Language 1	Language 2

Semester 5	Semester 6
Modern Algebra 1 (MATH 351)	Real and Abstract Analysis 1 (MATH 361)
Math Elective	Math Elective
Math Elective	Common Area Requirement
Common Area Requirement	Common Area Requirement
Economics <sup>5</sup>	

#### **Math Electives**

The five upper-level courses in mathematics must satisfy three of four breadth areas. Two of the upper-level courses must form a linked sequence.

#### **Additional Courses**

Please note that an overload (5 courses) may be required some semesters. AP credits or summer courses can sometimes be applied to eliminate the need for overloads. Additional courses may be required for some engineering majors at Columbia. See the Pre-Combined Plan Curriculum Guide on Columbia's web page.

<sup>1</sup> This course requirement may be fulfilled with a score of 4 or 5 on the Calculus AB Advanced Placement exam or the completion of MATH 133.

<sup>2</sup> This course requirement may be fulfilled with the completion of MATH 134 or a score of 4 or 5 on the Calculus BC Advanced Placement exam.

<sup>3</sup> The full year of Montserrat may fulfill one common area requirement (CAR). It is important that students do not take Montserrat courses that only fulfill a math or natural science requirement.

<sup>4</sup> Columbia requires a course in composition. Students may wish to take a CRAW course that also fulfills the LIT CAR.

<sup>5</sup> Columbia requires a course in economics. ECON 199 may be taken. This will also fulfill one SOC SCI CAR.

## Physics Major

Semester 1	Semester 2
Calculus 1 <sup>6</sup> (MATH 135 or equivalent)	Calculus 2 <sup>7</sup> (MATH 136 or equivalent)
Physics 1 <sup>8</sup> (PHYS 115)	Physics 2 (PHYS 116)
Montserrat	Montserrat <sup>9</sup>
Common Area Requirement	Critical Reading and Writing <sup>10</sup>

Semester 3	Semester 4
Multivariable Calculus (MATH 241)	Classical Mechanics (PHYS 342)
Modern Physics (PHYS 223)	Modern Physics Lab (PHYS 225)
Methods of Physics (PHYS 221)	Thermal Physics (PHYS 344)
Chemistry 1 (CHEM 181)	Common Area Requirement
	Common Area Requirement

Semester 5	Semester 6
Quantum Mechanics (PHYS 353)	Electromagnetic Theory (PHYS 351)
Physics Elective	Physics Elective
Computer Science (CSCI 131)	Common Area Requirement
Language 1	Language 2
Economics <sup>11</sup>	

### Physics Electives

One of the physics electives must be taken with a laboratory.

### Additional Courses

Please note that an overload (5 courses) may be required some semesters. AP credits or summer courses can sometimes be applied to eliminate the need for overloads. Additional courses may be required for some engineering majors at Columbia. See the Pre-Combined Plan Curriculum Guide on Columbia's web page.

---

<sup>6</sup> This course requirement may be fulfilled with a score of 4 or 5 on the Calculus AB Advanced Placement exam or the completion of MATH 133.

<sup>7</sup> This course requirement may be fulfilled with the completion of MATH 134 or a score of 4 or 5 on the Calculus BC Advanced Placement exam.

<sup>8</sup> This course requirement may be fulfilled with a Physics 2 or a Physics C Advanced Placement exam and an individual assessment by the Physics Department.

<sup>9</sup> The full year of Montserrat may fulfill one common area requirement (CAR). It is important that students do not take Montserrat courses that only fulfill a math or natural science requirement.

<sup>10</sup> Columbia requires a course in composition. Students may wish to take a CRAW course that also fulfills the LIT CAR.

<sup>11</sup> Columbia requires a course in economics. ECON 199 may be taken. This will also fulfill one SOC SCI CAR.

### Computer Science Major

Semester 1	Semester 2
Calculus 1 <sup>12</sup> (MATH 135 or equivalent)	Calculus 2 <sup>13</sup> (MATH 136 or equivalent)
Physics 1 (PHYS 115)	Physics 2 (PHYS 116)
Montserrat	Montserrat <sup>14</sup>
Techniques of Programming <sup>15</sup> (CSCI 131)	Data Structures (CSCI 132)

Semester 3	Semester 4
Multivariable Calculus (MATH 241)	Programming Languages Design (CSCI 324)
Computer Systems (CSCI 226)	Computer Science Elective
Analysis of Algorithms (CSCI 235)	Critical Reading and Writing <sup>16</sup>
Chemistry 1 (CHEM 181)	Common Area Requirement
Common Area Requirement	

Semester 5	Semester 6
Computer Science Ethics (CSCI 328)	Discrete Structures (CSCI 135) <sup>17</sup>
Computer Science Elective	Computer Science Elective
Common Area Requirement	Common Area Requirement
Economics <sup>18</sup>	Common Area Requirement
Language 1	Language 2

#### **Additional Courses**

Please note that an overload (5 courses) may be required some semesters. AP credits or summer courses can sometimes be applied to eliminate the need for overloads. Additional courses may be required for some engineering majors at Columbia. See the Pre-Combined Plan Curriculum Guide on Columbia's web page.

<sup>12</sup> This course requirement may be fulfilled with a score of 4 or 5 on the Calculus AB Advanced Placement exam or the completion of MATH 133.

<sup>13</sup> This course requirement may be fulfilled with the completion of MATH 134 or a score of 4 or 5 on the Calculus BC Advanced Placement exam.

<sup>14</sup> The full year of Montserrat may fulfill one common area requirement (CAR). It is important that students do not take Montserrat courses that only fulfill a math or natural science requirement.

<sup>15</sup> This course requirement may be fulfilled with a score of 4 or 5 on Computer Science A Advanced Placement exam.

<sup>20</sup> Columbia requires a course in composition. Students may wish to take a CRAW course that also fulfills the LIT CAR.

<sup>17</sup> Algebraic Structures (MATH 243) may be substituted for Discrete Structures.

<sup>21</sup> Columbia requires a course in economics. ECON 199 may be taken. This will also fulfill one SOC SCI CAR.