

Virginia Tech Advising Guide

BRCC Associate of Science Degree – Engineering Specialization Curriculum Outline
Advising Guide for Engineering at Virginia Tech

Advising notes before proceeding (revised for 2018 – 2019)

BRCC is a participant in the [VCCS-wide articulation agreement between VCCS colleges and the VA Tech School of Engineering](http://www.vccs.edu/students/transfers/) [http://www.vccs.edu/students/transfers/].

Virginia Tech has created an excellent new [transfer tool that breaks down VCCS recommendations by major](http://www.tranguide.registrar.vt.edu/2018/recbymajor.html) [http://www.tranguide.registrar.vt.edu/2018/recbymajor.html]. This is particularly helpful for Engineering majors, because recommended EGR electives vary depending on whether you're looking at Civil, Mechanical, Electrical, and so on, and the tool breaks it down. Here are a few for the common majors:

Major	Suggested Electives
Chemical Engineering	CHM 241*, 242* (if available)
Civil Engineering	EGR 206, 246; GOL 105* (in place of CHM 112)
Computer Science	CSC 201, 202*, 205*
Construction Engineering and Management	EGR 206, 246; ECO 201**, 202**
Electrical Engineering	EGR 206, 251* (through NVCC distance)
Industrial and Systems Engineering	EGR 126, 206, 251* (through NVCC distance)
Mechanical Engineering	EGR 126, 246

* Requires program substitution – ask a program advisor

**Choose ECO 201 or 202 as Social Science Elective

Virginia Tech does require CHM 111 for all Engineering transfers, but does not make CHM 112 a general requirement. If your major recommends GOL 105, we will approve a substitution for CHM 112,

In 2018-19, the VCCS phased out all the existing Mathematics courses, and replaced them with new versions and new course numbers. This has a significant impact on Engineering, particularly for people who start under the old system and graduate under the new. Please email one of from your program advisors (below) if you need assistance with this transition. The table below indicates the changes to the math courses.

Old math courses	Credits	New math courses	Credits
MTH 163 – Precalculus I	3	MTH 161 – Precalculus I	3
MTH 164 – Precalculus II	3	MTH 162 – Precalculus II	3
MTH 166 – Precalculus with Trigonometry	5	MTH 167 – Precalculus with Trigonometry	5
MTH 173 – Calculus I	5	MTH 263 – Calculus I	4
MTH 174 – Calculus II	5	MTH 264 – Calculus II	4
MTH 277 – Vector Calculus	4	MTH 265 – Calculus III	4
MTH 177 – Linear Algebra	2	MTH 266 – Linear Algebra	3
MTH 285 – Linear Algebra	3	MTH 266 – Linear Algebra	3
MTH 291 – Differential Equations	3	MTH 267 – Differential Equations	3

Students seeking academic advising for this major are encouraged to meet with BRCC Professors Mr. Bob Zickefoose (Engineering, T103, zickefooseb@brcc.edu), Dr. Jonathan Cook (Physics, T205, cookj@brcc.edu), or Ms. Lynne Ryan (Mathematics, T123, ryanl@brcc.edu).

Additionally, [Ms. Christi Boone](http://www.eng.vt.edu/personnel/christi-boone) [http://www.eng.vt.edu/personnel/christi-boone] serves as the Engineering transfer advisor for students at VA Tech. Ms. Boone visits the BRCC campus once a year to speak with prospective VA Tech Engineering majors, and is available by email to help with VA Tech specific questions.

Progression through the AS – Science – Engineering Program

Progression through the AS – Science – Engineering depends on the student's initial level of math placement. Students who do not already have credit for Precalculus (either MTH 161/162 or MTH 167) are strongly advised to take the [Virginia Placement Test \(VPT\) for Math](https://www.brcc.edu/services/testingcenter/placement-testing/vpt-math/) [https://www.brcc.edu/services/testingcenter/placement-testing/vpt-math/] to see if they can place directly into Calculus I (MTH 263). Students with a Precalculus placement for either MTH 161 or MTH 167 are encouraged to attempt MTH 167 if they have a strong background in high school mathematics (A and B grades for all high school mathematics through at least Algebra II/Trigonometry, with a high school course in Precalculus or Functions preferred).

With a MTH 263 start, an AS – Science – Engineering Degree can be completed in 2 years, with four semesters at 17 credits each. With a MTH 167 start, it is still possible to complete in two years with a catch-up Summer semester. While typical for Engineering degrees, this is an extremely heavy credit load, and is not feasible for many students. Keep in mind that your first priority as a student seeking to transfer to a four year Engineering program is **academic excellence**, and not finishing quickly – Virginia Tech is expecting you to maintain A's and B's in your math, science, and Engineering coursework. Many students opt to spread out the coursework for the AS over three years to make the load more manageable, or complete some of their General Education requirements during the Summer sessions to reduce the credit load in Fall/Spring.

The following pages of the guide show pathways for

- A two year plan for students who start in MTH 263
- A two year plan for students who start in MTH 167
- A three year plan for students who start in MTH 161

Students who place at a developmental level of mathematics must complete all requirements for MTE 1-9 before they can begin the math sequence starting at MTH 161.

The AS – Science – Engineering Specialization requires a minimum of 67 credits to complete. However, in order to meet BRCC's Associate of Science degree requirements, meet all prerequisites to those requirements, *and* fulfill Virginia Tech recommended transfer course requirements for Engineering, students may need to complete additional credits at BRCC depending on their mathematics placement.

The Engineering Specialization truly starts when the student reaches MTH 263, as Calculus is the gateway to all Engineering courses except Introduction to Engineering (EGR 120) and EGR 206 (Engineering Economics). Students in Precalculus or developmental mathematics are “pre-Engineering” and may wish to declare the more general AS-Science initially before committing to the Specialization.

All mathematics, science, and Engineering courses should be taken in the order they appear, in the semester they appear. Math, science, and Engineering are strictly sequenced in terms of prerequisites, and have limited course offerings. When you see a course appearing in a specific semester in the guide above (e.g. EGR 140 always appears as Spring class), assume unless confirmed otherwise that that is the *only* semester in which the course is offered, and if you miss it, you will not be able to schedule it until the following year.

MTH 263 start (2 years to completion)

First Semester (Fall I)

Course #	Course Description	Credits
ENG 111	College Composition I	3
HIS ____	History (101, 102, 111, 112, 121, or 122)	3
MTH 263	Calculus I	4
CHM 111	General Chemistry I	4
EGR 120	Introduction to Engineering	2
SDV	Student Development (SDV 101 "for STEM" strongly recommended, but SDV 100 may be used)	1
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Second Semester (Spring I)

Course #	Course Description	Credits
ENG 112	College Composition II	3
EGR 140	Engineering Mechanics - Statics	3
MTH 264	Calculus II	4
_____	Social Science Elective	3
CHM 112 [or GOL 105 ⁽¹⁾]	General Chemistry II [or Physical Geology]	4
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Third Semester (Fall II)

Course #	Course Description	Credits
ENG ____	Literature Elective	3
PHY 241	University Physics I	4
EGR elective(s) ⁽²⁾	[EGR 126 and 246 are Fall only. If taking 206, move one elective slot to Spring.]	6
MTH 265	Calculus III	4
		17

Fourth Semester (Spring II)

Course #	Course Description	Credits
MTH 267	Differential Equations	3
MTH 266	Linear Algebra	3
PHY 242	University Physics II	4
_____	Humanities/Fine Arts Elective	3
EGR 245	Engineering Mechanics - Dynamics	3
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MTH 167 start (2 years to completion with summer)

First Semester (Fall I)

Course #	Course Description	Credits
ENG 111	College Composition I	3
HIS ____	History (101, 102, 111, 112, 121, or 122)	3
MTH 167	Precalculus with Trigonometry	5
CHM 111	General Chemistry I	4
EGR 120	Introduction to Engineering	2
SDV	Student Development (SDV 101 "for STEM" strongly recommended, but SDV 100 may be used)	1
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Second Semester (Spring I)

Course #	Course Description	Credits
ENG 112	College Composition II	3
EGR 140	Engineering Mechanics – Statics	3
MTH 263	Calculus I	4
_____	Social Science Elective	3
CHM 112 [or GOL 105 ⁽¹⁾]	College Chemistry II [or Physical Geology]	4
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Summer Catch-up

Course #	Course Description	Credits
MTH 264	Calculus II	4

Third Semester (Fall II)

Course #	Course Description	Credits
ENG ____	Literature Elective	3
PHY 241	University Physics I	4
EGR elective(s) ⁽²⁾	[EGR 126 and 246 are Fall only. If taking 206, move one elective slot to Spring.]	6
MTH 265	Calculus III	4
		17

Fourth Semester (Spring II)

Course #	Course Description	Credits
MTH 267	Differential Equations	3
MTH 266	Linear Algebra	3
PHY 242	University Physics II	4
_____	Humanities/Fine Arts Elective	3
EGR 245	Engineering Mechanics - Dynamics	3
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MTH 161 start (3 years to completion)

Note that starting in MTH 161 will require three years to complete the math/physics sequence, and there is no way to do this at a full time load for all six semesters. Plan accordingly.

First Semester (Fall I)

Course #	Course Description	Credits
ENG 111	College Composition I	3
HIS ____	History (101, 102, 111, 112, 121, or 122)	3
MTH 161	Precalculus I	3
EGR 120	Introduction to Engineering	2
SDV	Student Development (SDV 101 "for STEM" strongly recommended, but SDV 100 may be used)	1
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Second Semester (Spring I)

Course #	Course Description	Credits
ENG 112	College Composition II	3
MTH 162	Precalculus II	3
_____	Social Science Elective	3
EGR elective ⁽²⁾	Engineering Economics ⁽³⁾	3
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Third Semester (Fall II)

Course #	Course Description	Credits
MTH 263	Calculus I	4
CHM 111	College Chemistry I	4
ENG ____	Literature Elective	3
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Fourth Semester (Spring II)

Course #	Course Description	Credits
EGR 140	Engineering Mechanics - Statics	3
MTH 264	Calculus II	4
CHM 112 [or GOL 105 ⁽¹⁾]	College Chemistry II [or Physical Geology]	4
_____	Humanities/Fine Arts Elective	3
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Fifth Semester (Fall III)

Course #	Course Description	Credits
PHY 241	University Physics I	4
EGR elective ⁽²⁾	EGR 126 or EGR 246 (or both, if EGR 206 not taken)	3
MTH 265	Calculus III	4
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Sixth Semester (Spring III)

Course #	Course Description	Credits
MTH 267	Differential Equations	3
MTH 266	Linear Algebra	3
PHY 242	University Physics II	4
EGR 245	Engineering Mechanics - Dynamics	3
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Footnotes (all progressions)

- (1) GOL 105 for CHM 112 does require a program substitution. Students may obtain the form from Academic Advising, and bring it to any of the program faculty advisors to sign. Get the substitution approved before you sign up for the class.
- (2) EGR 126 (or CSC 201), EGR 206 and EGR 246 are the most common Virginia Tech recommended EGR electives. Other choices are possible, and if your VA Tech recommendations specifically list a different course, we will work to make a substitution for you. You have six credits to fill, and will need to modify a bit depending on choice: currently, EGR 126 and EGR 246 are Fall only, while EGR 206 is Spring only. Our EGR 115 currently does not have a Virginia Tech equivalent, and is not recommended.
- (3) We have placed EGR 206 in the second semester Spring of the three year plan since it can be completed without Calculus. However, if your particular VT major doesn't want EGR 206, you can wait for EGR 126 and 246 as later choices.

Finally and most importantly

Come in and meet your program professors at the beginning of your program! Professors Zickefoose, Cook, and Ryan (contact info on the first page) will work with Engineering students to help them plan their courses, and provide advice on what is needed to successfully transfer to Virginia Tech.