



Manufacturing Engineering Advising Sheet 2025W

All courses required for the [Bachelor of Applied Science in Manufacturing Engineering](#) are below. Students can customize their registration to complete their degree in 4 or 5 years, as they prefer. Full course descriptions can be found [here](#). Course vectors, prerequisites (in red), and corequisites (in orange) are included. Review this document thoroughly annually, particularly the 4th year electives starting on Page 2, which change year to year.

4-year plan

5-year plan

| Term 1 | Term 2 |
|--|--|
| APSC_O 169 Fundamentals of Sustain. Eng. Design [3-2-0] | APSC_O 173 Engineering Analysis II [3-0-1] <i>APSC_O 172</i> |
| APSC_O 172 Engineering Analysis I [3-0-1] | APSC_O 177 Engineering Computation and Instrumentation [3-2*-0] ¹ |
| APSC_O 179 Linear Algebra for Engineers [3-0-0] | APSC_O 178 Electricity, Magnetism, and Waves [3-0-1] <i>APSC_O 172, 173</i> |
| APSC_O 180 Statics [3-0-2] <i>APSC_O 179</i> | APSC_O 181 Dynamics [3-0-2] <i>APSC_O 172, 180, 173</i> |
| APSC_O 182 Matter and Energy I [2-2*-2*] | APSC_O 183 Matter and Energy II [2-2*-2*] |
| APSC_O 176 Engineering Communication [3-0-0] | APSC_O 171 Engineering Drawing and CAD/CAM [3-0-2] |
| APSC_O 246 System Dynamics [3-0-1] <i>APSC_O 173, 179, 181</i> | APSC_O 201 Technical Communication [3-0-0] <i>APSC_O 176</i> |
| APSC_O 248 Engineering Analysis III [3-0-1] <i>APSC_O 173</i> | APSC_O 253 Fluid Mechanics I [3-2*-1] <i>APSC_O 180, 181, 248</i> |
| APSC_O 252 Thermodynamics [3-0-1] <i>APSC_O 173, 182</i> | APSC_O 255 Electric Circuits and Power [3-2*-1] <i>APSC_O 178</i> |
| APSC_O 259 Materials Science I [3-2*-0] <i>APSC_O 182, 183</i> | APSC_O 260 Mechanics of Materials I [3-0-1] <i>APSC_O 173, 180</i> |
| APSC_O 254 Instrumentation and Data Analysis [3-2*-1] <i>APSC_O 172, 178</i> | MANF_O 277 Fundamentals of Design for Manu ³ [3-2-0] <i>APSC_O 171 and second-year standing</i> |
| COSC_O 121 Computer Programming II ² [3-2-0] <i>60% or higher in APSC_O 177 or COSC_O 111</i> | MANF_O 270 Production Systems Management I [3-0-0] <i>Second-year standing</i> |
| ENGR_O 376 Materials Science II [3-0-0] <i>APSC_O 259</i> | ENGR_O 305 Engineering Economic Analysis [3-0-0] <i>Second-year standing</i> |
| ENGR_O 387 Vibration of Mechanical Systems [3-0-1] <i>APSC_O 246</i> | ENGR_O 320 Electromechanical Devices ⁴ [3-2*-1] <i>APSC_O 255</i> |
| CMPE_O 386 Industrial Automation ⁵ [3-2-0] <i>APSC_O 177</i> | CMPE_O 301 Software System & Design for Eng. ⁶ [2-2-0] <i>CMPE_O 386</i> |
| MANF_O 330 Manufacturing Engineering Project I ⁷ [1-4-0; 1-4-0] <i>MANF_O 277 or 230</i> | |
| MANF_O 370 Production Systems Management II [3-0-0] <i>MANF_O 270</i> | ENGR_O 315 Systems and Control ⁸ [3-2*-1] <i>APSC_O 246</i> |
| MANF_O 377 Manufacturing Processes ⁹ [2-3*-1] <i>APSC_O 259, 260</i> | MANF_O 378 Advanced Manufacturing ¹⁰ [3-0-0] <i>MANF_O 377</i> |
| MANF_O 460 Supply Chain Tactics and Strategies [3-0-0] <i>Fourth-year standing</i> | <i>Humanities Elective</i> |
| MANF_O 470 Production Systems Management III [3-0-0] <i>MANF_O 370</i> | MANF_O 450 Life Cycle Analysis and Sustainability [3-0-0] <i>Fourth-year standing</i> |
| MANF_O 455 Facility Planning [3-0-0] <i>Fourth-year standing</i> | MANF_O 465 Digital Enterprise [3-2-0] <i>MANF_O 386</i> |
| <i>Elective</i> | ENGR_O 413 Law and Ethics for Engineers [3-0-0] <i>Third-year standing</i> |
| <i>Elective</i> | <i>Elective</i> |
| ENGR_O 499 Engineering Capstone Design Project [2-3-0; 0-6-0] <i>Fourth-year standing</i> | |

¹ COSC_O 111 can be substituted for APSC_O 177, especially for students planning to pursue the Minor of Computer Science. If taken instead of APSC_O 177, COSC_O 111 will count towards the Minor requirements and the program requirements.

² COSC_O 210 or COSC_O 222 will also fulfill this requirement if taken in 2024S or earlier.



- ³ Students who have already taken MANF_O 230 in 2022W or earlier are not required to take MANF_O 277 to fulfill degree requirements.
- ⁴ Aerospace Concentration students must take ENGR_O 310 instead of ENGR_O 320. Please review Page 3 of this document carefully for required modifications to this schedule.
- ⁵ Students cannot receive credit for both CMPE 386 and MANF 386. MANF 386, if taken in 2023W or 2024W will be accepted towards this degree requirement.
- ⁶ Students who have taken COSC_O 310 in 2024W or earlier are not required to take CMPE_O 301 to fulfill degree requirements
- ⁷ Students who have taken MANF_O 330 in 2022W or earlier are not required to take MANF_O 377 to fulfill degree requirements.
- ⁸ Students who have already taken MANF_O 386 in 2022W or earlier are not required to take ENGR_O 315 to fulfill degree requirements.
- ⁹ ENGR_O 377 has been renamed MANF_O 377. Students cannot obtain credit for both courses.
- ¹⁰ ENGR_O 439 has been renamed MANF_O 378. Students cannot obtain credit for both courses.

Note: ENGR_O 368, ENGR_O 381 and ENGR_O 476 are no longer required courses in the program but can be counted as an alternative elective or an approved manufacturing elective (as indicated below). Students who are uncertain should review reach out to Engineering Academic Services at soe.academicsservices@ubc.ca.

Fourth Year Guide 2025W

Approved Manufacturing Electives*

Manufacturing students must choose at least 1 and up to 3 courses.

Term 1:

ENGR_O 418 Applied Machine Learning for Eng.

[3-0-0] *Fourth-year standing*

ENGR_O 475 Materials Selection and Design

[3-0-1*] *ENGR_O 376*

ENGR_O 476 Mechanics of Materials II

[3-0-0] *APSC_O 260*

ENGR_O 480 Modern Control

[3-0-0] *ENGR_O 315¹¹*

ENGR_O 489 Multicriteria Optimization & Design of Exp.

[3-2*-0] *Fourth-year standing*

ENGR_O 492 Finite Element Methods

[3-0-0] *Fourth-year standing*

Term 2:

ENGR_O 400 Applied Machine Vision for Engineers

[3-0-0] *Fourth-year standing*

ENGR_O 453 Internet of Things

[3-2*-0] *APSC_O 254*

ENGR_O 454 Motor Drive Systems

[3-2*-0] *ENGR_O 320*

ENGR_O 469 Polymer Engineering

[3-0-0] *APSC_O 259, 260*

ENGR_O 481 Mechatronics

[3-2*-0] *ENGR 315¹¹, ENGR 320*

ENGR_O 486 Robot Modelling and Control

[3-0-0] *ENGR 315*

ENGR_O 407 Inclusive Design [3-2-0] **Third-year standing Offered Summer 2025 as an Elective***

*ENGR_O 498A Global Seminar: China [3-0-0] **Offered Summer 2025 as an Elective***

¹¹ MANF_O 386 will be considered to have fulfilled the prerequisite for this course, only if taken in 2022W or earlier.

Aerospace Concentration students, please review pg.3 of this document carefully.

Alternative Electives

Manufacturing students may substitute up to 2 electives with approved alternate electives.

- Any other UBCO APSC_O, CMPE_O, ENGR_O, or MANF_O 300- or 400-level courses, although registration in such courses is subject to prerequisite requirements (or prerequisite waiver approval if the prerequisite requirements are not met).
 - Note, MANF_O 416 is NOT eligible to be credited towards a Manufacturing Engineering degree and should not be taken by Manufacturing Engineering students.
 - ENGR 405 Engineering Leadership is Offered Summer 2025 as an Alternative Elective
- Graduate 500-level courses from within the School of Engineering. For courses cross-listed as undergraduate (400 level) and graduate (500 level) courses, you must register in the undergraduate version. To be considered, you must have completed at least half of required 300- and 400- level courses (at least 36 credits) with a minimum average of 80% in those courses, completed all prerequisites, and obtained permission from the course instructor. If you meet the criteria, you must complete the [Registration Waiver Request](#) to be registered in a graduate course. Graduate courses being offered are listed as APSC_O 5XX and ENGR_O 5XX courses on the course schedule.
- External (non-APSC_O/CMPE_O/ENGR_O/MANF_O) courses. Some external courses are pre-approved as technical electives (see below). Note that not all of these courses are offered each academic year and you will need to check the



course schedule to see availability. If you are missing the course's prerequisite(s), you need to complete the registration waiver process for the external course's instructor/department. The School of Engineering cannot register you in external courses. If you would like to request permission to take a course outside of SOE as an alternative elective that does not appear on this list, please contact soe.academicsservices@ubc.ca and include a course syllabus. It will be reviewed by the Manufacturing Engineering Program Chair.

* Notes

- **Graduation: In your final year, you are required to apply for graduation, even if you don't plan on attending the ceremony.** If you intend to graduate, you must [apply to graduate](#) by the deadline. Students are responsible for taking the correct courses to fulfill degree requirements and to apply for graduation before the deadline.
 - Once you are registered in the final courses for your degree, you are strongly encouraged to request an update to your Academic Progress Report by the Engineering Academic Services team so you can see whether you are fulfilling all requirements by filling out the [APR Update Request](#).
- **Courses:**
 - The 4th year advising sheet changes annually. Courses offered this year may not be offered in subsequent years. If a course switches between technical elective and alt. tech. elective designations between years, the student should refer to the sheet from the year the course was taken to know how it will be used to fulfill their degree requirements.
 - Courses are subject to minimum and maximum enrolments. The School of Engineering reserves the right to cancel a course if the minimum enrolment is not met. If a course is cancelled, you will be notified via e-mail. Check the course schedule to see the course availability.
 - Depending on the level of engineering design and the assigned instructor, the classification of a course as either a design elective or a technical elective is subject to change.
 - Course descriptions, with prerequisites, can be found on the Academic Calendar. In case of conflict between the information in this sheet and the calendar, the calendar takes precedence:
<https://okanagan.calendar.ubc.ca/course-descriptions-0>

For inquiries regarding registration or academic advising, contact an [Academic and Career Advisor](#)
Manufacturing Engineering Program Chair: Dr. Dean Richert: dean.richert@ubc.ca

Aerospace Engineering Concentration

The Aerospace Concentration is available for manufacturing engineering students interested in aerospace engineering. There is information on Concentrations on the [Academic Calendar](#) and the [School of Engineering website](#). Concentrations do not have enrolment caps and students must declare their Concentration themselves in Workday before submitting their application for graduation.

The Aerospace Concentration requires completion of 12 credits of the following. These electives will be counted towards the requirements of the Bachelor of Applied Science in Manufacturing Engineering AND the Aerospace Concentration if completed before graduation.

Take:

ENGR_O 310 Fluid Mechanics II¹²

ENGR_O 493 Introduction to Aerodynamics and Aircraft Design (Alternative Elective)¹³

AND

Choose 2 of the below:

ENGR_O 449 Aircraft Structures (Alternative Elective)¹³ **Not Offered in 25W**

ENGR_O 476 Mechanics of Materials II (Alternative Elective)¹³

ENGR_O 477 Aircraft Propulsion (Alternative Elective)¹³

ENGR_O 479 Measurement Principles in Thermal-Fluids (Alternative Elective)

ENGR_O 480 Modern Control

ENGR_O 491 Computational Fluid Dynamics (Alternative Elective)¹³

ENGR_O 492 Finite Element Methods

MANF_O 496 Aerospace Materials and Manuf. Processes **Not Offered in 25W**

¹² ENGR_O 310 can be taken as part of the program's 3rd year requirements instead of ENGR_O 320. To accommodate this change, we recommend taking MANF_O 370 in 4th year and ENGR_O 493 in 3rd year and shifting one course from Year 4 Term 2 into Year 3 Term 2.



¹³ ENGR_O 449, 476, 477, 479, 491, 493 (if selected) will count as an Alternative Elective (see Page 2).

The student is responsible for ensuring that electives chosen meet the Manufacturing Engineering program requirements for electives. Note the restriction on no more than 6 credits of alternative electives. If the student opts into the concentration before submitting the application to graduate and successfully completes the concentration requirements, the notation "Aerospace Concentration" will be included on the student's transcript.