**The Faculty of Aerospace Engineering**

**Curriculum for the 2022–2023 Academic Year**

**Toward a B.Sc. in Aerospace Engineering through the Aeronautics or Astronautics**

**Study Tracks**

To complete the degree students are required to accumulate at least 160 credits according to the following specification:

Compulsory courses – 5.86 credits

Compulsory track courses (marked with a \*) – 11 credits

Elective faculty courses (to be chosen from a specific set of options) – 17 or 18 credits

Elective faculty courses – 5.33 or 5.32 credits

Elective Technion courses – 12 credits

**4** free choice credits

**6** enrichment credits (Council for Higher Education)

**2** physical education credits

E – exercise; La – lab; C – credits; Le – lecture

**Compulsory courses: Recommended course set by semesters**

**1st Semester:** Le. E. La. C. 4 2 5.0 XXXX 104018 4.5 – 2 4 XXXX 104019 2.5 – 1 2 1 XXXX 114051 4.0 2 2 2 XXXX 234128 3.0 – 2 2 XXXX 125001\* 324033 XXXX 9 2 22.0 0.3 – 4

**2nd Semester:** Le. E. La. C. 4 2 – 5.0 XXXX 104022 2.5 – 1 2 regular units XXXX 104131 3.5 – 1 3 2 XXXX 1104052 4.0 – 2 3 XXXX 084506 2.5 – 1 2 XXXX 16 9 – 17.5 314200\*

**3rd Semester:** Le. E. La. C. 2 1 – 2.5 XXXX 104215 3.0 – 2 2 XXXX 104228 4.0 – 2 3 XXXX 0842133 4.0 – 2 3 XXXX 084225 4.0 – 2 3 XXXX 11 13 – 17.5 094411

**4th Semester:** Le. E. La. C. 2 1 – 2.5 XXXX 084135 3.5 – 1 3 XXXX 084311 2.5 – 1 2 XXXX 084515 4.0 – 4 2 XXXX 084630 3.0 1 1 2 XXXX 084737 3.5 – 1 3 3 XXXX 14 9 1 19.0 114054

**1**

**5th Semester:** Le. E. La. C.

044102 XXXX (\*) - 2.5 1 1 2 XXXX 084312 3.5 1 1 3 XXXX 084314 3.5 – 1 3 XXXX\* 084641 3.0 1 1 2 XXXX 084738 084154 XXXX 1 3 5.2

\*\* For elective core aeronautics or astronautics courses to be chosen from a specific set of options, see details later on 1 2 13 5 4 17.5 5.2

\* 4 Lecture hours, one-time. Compulsory prior to performing lab work as part of XXXX. No credits awarded.

**6th Semester:** Le. E. La. C. 3 1 1 4.0 044098 2.5 1 2 XXXX 2.5 1 2 XXXX 084143\* \*\*\*XXXX – 6 5.2

\*\* For elective core aeronautics or astronautics courses to be chosen from a specific set of options, see details below (5 or 6).

**7th Semester:** Le. E. La. C. 7 2 1 – 3.0 \*\*\*\*design project\*\*\*\* 1.0 – 2 seminar

\*\*\*\* Design project 8

C – 3.0
La –
E – 1
Le –

**Elective Courses to be Chosen from a Specific Set of Options**

\*\* Students are required to choose one of the following groups of core courses:

**8th Semester**

**Core Aeronautics Courses**

Le. E. La. C.

(1st Semester) 5 2 1 – 2.5 XXXX 084220 – 1 2 (6th Semester) 2 XXXX 084221 2.5 – 1 2 (6th Semester) XXXX 5 (2 1 2.5 085406 or 085407 XXXX

**Core Astronautics Courses**

Le. E. La. C.

(5TH Semester) 2 1 2.5 XXXX 084913 3.5 – 1 3 (6th semester) XXXX 085915 085406 XXXX or 085920 XXXX (6th semester) 5.2 – 1 2

\*\*\* Students are required to choose one of the following advanced experimental courses: 084156 XXXX, 085305 XXXX, 085405 XXXX, 085455 XXXX, 085505 XXXX, 085705 XXXX, 085220 XXXX, 085905 XXXX, or 085156 XXXX. We recommended choosing based on the choice of clusters.

\*\*\*\* Design projects 7 and 8 comprise the final annual project. They will be chosen as a pair from XXXX 084651 in the winter and 084652 in the spring, or XXXX 084653 in the winter and XXXX 084654 in the spring.

\*\*\*\*\* Students are required to choose only one of the following seminars: 085801 XXXX, 085802 XXXX, 085803 XXXX, 085804 XXXX, 085805 XXXX, or 085806 XXXX. We recommended choosing based on the choice of clusters.

**2**

**Elective Courses**

Students are required to choose at least 24 credits from three of the seven clusters specified below, with at least 8 credits from each cluster. The remaining required credits can be chosen from the elective faculty courses and the list of elective courses offered by other faculties specified on the faculty’s website. The scope of elective courses from other faculties cannot exceed 9 credits. A course taken as a core course will not be considered an elective course. The list of elective courses may be updated occasionally. Please note announcements published on the website and at the secretariat.

**Aerodynamics and Aeroacoustics Course Clusters**

Le. E. La. C.

2 – 1.0 XXXX 085326 086172 XXXX 3 – 0.3 086320 XXXX 0.3 – 3

1 3 – 3.0 XXXX 086321 3.0 – 3 XXXX 086366 3.0 – 3 XXXX 086376 3.0 – 3 XXXX 086380

086385 XXXX 3 – 0.3 086389 XXXX 3 – 0.3 086395 XXXX 0.3 – 3

3 – 3.0 XXXX 086390 086484 XXXX 3 – 0.3 086800 XXXX 0.3 – 3

3 – 3.0 XXXX 086802 088320 XXXX 3 – 0.3 088780 XXXX – 3 – 0.3

**Aeronautics Course Cluster**

1 2 1 – 2.5 XXXX 084220 2.5 – 1 2 2 XXXX 084221 3.0 – 3 1 XXXX 086241 086201 XXXX 086219 0.3 – 3 XXXX 086755 0.3 – 3 XXXX 0.3 – 3

**Astronautics Course Cluster**

 2 1 – 2.5 XXXX 084913 085691 XXXX 3 – 0.3 3.5 – 1 3 XXXX 085915 2.5 – 1 2 XXXX 085920 3.0 – 3 XXXX 086288 3.0 – 3 XXXX 086290 3.0 – 3 XXXX 086920 086385 XXXX 3 – 0.3 3.0 – 3 1 XXXX 086921 3.0 – 3 XXXX 3.0 – XXXX 086924 0086925 XXXX 0.3 3

**Guidance, Navigation, Control, and Autonomous Systems Course Cluster**

085735 XXXX 3 – 0.3 3.0 – 3 XXXX 086220 086289 XXXX 3 – 0.3 3.0 – 3 XXXX 086290 3.0 – 3 XXXX 086312 3.0 – 3 1 XXXX 086721 3.0 – 3 XXXX 086730 3.0 – 3 XXXX 086733 086755 XXXX 0.3 – 3

**3**

3 – 3.0 XXXX 086759 3.0 – 3 XXXX 086760 086761 XXXX 3 – 0.3 086762 XXXX 3 – 0.3 3.0 – 3 XXXX 086777 3.0 – 3 XXXX 086920 3.0 – 3 1 XXXX 088751 3.0 – 3 2 XXXX 088752 088759 XXXX 3 – 0.3 3.0 – 3 XXXX 088792 3.0 1 – 3 XXXX 088900

**Energy Propulsion and Transformation Course Cluster**

Le. E. La. C.

2 1 – 2.5 XXXX 085406 2.5 – 1 2 XXXX 085407 086401 XXXX 3 – 0.3 086403 XXXX 3 – 0.3 3.0 – 3 XXXX 086414 3.0 – 3 1 XXXX 086461 086470 XXXX 3 – 0.3 3.0 – 3 XXXX 086478 3.0 – 3 XXXX 086480 086483 XXXX 3 – 0.3 086484 XXXX 3 – 0.3 088413 XXXX 0.2 – 2

We recommend students who choose this cluster take XXXX 085406 and XXXX 085407.

**Mechanics of Structures and Materials Course Cluster**

085550 XXXX 0.2 – 2 XXXX 3 – 3.0 086241 0.3 – 3 XXXX 0.3 – 3 086520 XXXX 086534 086521 XXXX 086535 0.3 – 3 XXXX 086574 0.3 – 3 XXXX 086577 0.3 – 3 XXXX 3 – 3.0 XXXX 3 – 3.0 086583 086901 XXXX 087532 0.3 – 3 XXXX 0.3 – 3 0.3 – 3 XXXX 088504

**Design and System Engineering Course Cluster**

2 – 2.0 XXXX – 4 – 2.0 085530 XXXX 085634 085640 XXXX 085677 0.2 – 2 XXXX 085678 0.3 – 1 XXXX 085691 0.3 – 2 XXXX – 3 085695 0.3 XXXX 086233 0.3 – 3 XXXX 2 – 2.0 0.3 – 3 XXXX 086650 086651 XXXX 0.2 – 2

**4**

**Additional Elective Courses**

085156 XXXX 085851 1 – 3 2.5 XXXX 085852 – 3.0 XXXX – 3.0

**Free Choice Courses Only**

–2 1.5 XXXX 085101-4

**5**

**The Aeronautics/Astronautics and Physics Track for a Dual-Major B.Sc. Degree in Aerospace Engineering and Physics**

To complete the degree students must accumulate at least 178 credits according to the following specifications:

Compulsory courses – 92 credits

Compulsory track courses (marked with a ~) – 29 credits

Elective aeronautics/astronautics courses to be chosen from a specific set of options – 5.8 or 5.9 credits

Elective aeronautics/astronautics courses – 24 or 23 credits

Elective physics courses – 5.12 credits

Elective Technion courses – 12 credits

**4** free choice credits

**6** enrichment credits (Council for Higher Education)

**2** physical education credits

E – exercise; La – lab; C – credits; Le – lecture

**Compulsory Courses**

Recommended course set by semesters:

**1st Semester:** Le. E. La. C. #

044102 XXXX (\*) – 5.5 – 3 4 XXXX 104031 5.0 – 2 4 XXXX 104016 5.0 – 2 4 XXXX 114074 1.5 3 – XXXX~ 114020 324033 XXXX – 4 20.0 0.3

4 # lecture hours, one-time, no credits awarded.

**2nd Semester:** Le. E. La. C.

4 3 – 5.5 XXXX 104013 5.0 – 2 4 XXXX 104035 5.0 – 2 4 XXXX 114076 4.0 – 2 3 XXXX 084506 ~ ##XXXX or XXXX (see details below) 5.1 or 0.3 22.5 or 21.0

**3rd Semester:** Le. E. La. C.

3 1 – 3.5 XXXX 104034 104223 XXXX 3 2 – 0.4 2.5 – 1 2 XXXX 104215 3.5 – 1 3 XXXX~ 114086 4.0 – 2 3 XXXX 114101 4.0 2 2 2 XXXX 21.5 234128

**4th Semester:** Le. E. La. C.

3 1 – 3.5 XXXX 084311 3.0 1 1 2 XXXX 084737 2.5 – 1 2 XXXX 084515 5.0 – 1 4 1 XXXX~ 115203 5.0 – 2 4 XXXX 114036 ~##XXXX or XXXX (see details below) or 5.1 20.5 or 22.0

**6**

**5th Semester:** Le. E. La. C.

084154 XXXX 1 3 5.2 1 1 2 XXXX 084312 3.5 1 1 3 XXXX 084314 3.0 1 1 2 XXXX 084738 1.5 3 – XXXX~ 114037 5.0 2 4 2 XXXX~ 115204 ### elective aeronautics or astronautics courses to be chosen from a specific set of options (see details below) 20.5 5.2

**6th Semester:** Le. E. La. C.

2 1 – 2.5 XXXX 084135 4.0 1 1 3 XXXX 044098 5.0 – 2 4 XXXX~ 114246 ### elective aeronautics or astronautics courses to be chosen from a specific set of options (see details below) 5 or 6 1.0 – 2 – seminar ####

**7th Semester:** Le. E. La. C. – 6 3.0 XXXX 114250~

**8th Semester:** Le. E. La. C. 2 4 – 4.0 XXXX 084630

**Physics Labs**

## Students taking XXXX (114021) are required to take XXXX (114038); students taking XXXX (114034) are required to take XXXX (114035)

**Choosing an Aeronautics/Astronautics Course Group**

### Students are required to choose one of the two following groups of core courses:

**Core aeronautics courses:**

Le. E. La. C.

1st Semester: 5 2 1 – 2.5 XXXX 084220 2.5 – 1 2 6

2nd Semester: XXXX 084221 2.5 – 1 2

6th Semester: XXXX 085407

**Core astronautics courses:**

Le. E. La. C.

5th Semester: 2 1 – 2.5 XXXX 084913 3.5 – 1 3

6th Semester: XXXX 085915 2.5 – 1 2

6th Semester: XXXX 085920

#### Students are required to choose only one of the following seminars: 085801 XXXX, 085802 XXXX, 085803 XXXX, 085804 XXXX 085805 XXXX, or 085806 XXXX.

**7**

**Elective Aeronautics/Astronautics Courses**

Aeronautics students are required to choose 24 credits; astronautics students are required to choose 23 credits. A course taken as a core course will not be considered an elective course. The list of elective courses may be updated occasionally. Please note announcements published on the faculty’s website or at the secretariat.

**Aerodynamics and Aeroacoustics Courses**

Le. E. La. C.

2 – 1.0 XXXX 085326 086172 XXXX 3 – 0.3 086320 XXXX 3.0 – 3 XXXX 086376 3.0 – 3 XXXX 086380 086385 XXXX 3 – 0.3 086389 XXXX 3 – 0.3 086395 XXXX – 3 0.3 3 – 3.0 XXXX 086390 086484 XXXX 3 – 0.3 086800 XXXX 0.3 – 3 3 – 3.0 XXXX 086802 088320 XXXX 3 – 0.3 088780 XXXX – 3 0.3

**Aeronautics Courses**

1 2 1 – 2.5 XXXX 084220 2.5 – 1 2 2 XXXX 084221 3.0 – 3 1 XXXX 086241 086210 XXXX 086219 0.3 – 3 XXXX 086755 0.3 – 3 XXXX 0.3 – 3

**Astronautics Courses**

2 1 – 2.5 XXXX 084913 085691 XXXX 3 – 0.3 3.5 – 1 3 XXXX 085915 2.5 – 1 2 XXXX 085920 3.0 – 3 XXXX 086288 3.0 – 3 XXXX 086290 3.0 – 3 XXXX 086920 086385 XXXX 3 – 0.3 3.0 – 3 1 XXXX 086921 3.0 – 3 XXXX 086923 3.0 – 3 XXXX 086924 086925 XXXX 0.3 3

**Guidance, Navigation, Control, and Autonomous Systems Courses**

085735 XXXX 3 – 0.3 3.0 – 3 XXXX 086220 086289 XXXX 3 – 0.3 3.0 – 3 XXXX 086290 3.0 – 3 XXXX 086312 3.0 – 3 1 XXXX 086721 3.0 – 3 XXXX 086730 3.0 – 3 XXXX 086733 086755 XXXX 3 – 0.3 3.0 – 3 XXXX 086759 3.0 – 3 XXXX 086760

**8**

086761 XXXX 3 – 0.3 086762 XXXX 3 – 0.3 3.0 – 3 XXXX 086777 3.0 – 3 XXXX 086920 3.0 – 3 1 XXXX 088751 3.0 – 3 2 XXXX 088752 088759 XXXX 3 – 0.3 3.0 – 3 XXXX 088792 3.0 1 – 3 XXXX 088900

**Energy Propulsion and Transformation Courses**

Le. E. La. C.

2 1 – 2.5 XXXX 085407 086401 XXXX 3 – 0.3 3.0 – 3 1 XXXX 086461 3.0 – 3 XXXX 086480 086483 XXXX 3 – 0.3 086484 XXXX 3 – 0.3 088413 XXXX 0.2 – 2

**Mechanics of Structures and Materials Courses**

085550 XXXX 0.2 – 2 XXXX 3 – 3.0 086241 0.3 – 3 XXXX 0.3 – 3 086520 XXXX 086534 086521 XXXX 086535 0.3 – 3 XXXX 086574 0.3 – 3 XXXX 0.3 – 3 3 – 3.0 XXXX 086577 XXXX 3 – 3.0 086583 086901 XXXX 087532 0.3 – 3 XXXX 0.3 – 3 0.3 – 3 XXXX 088504

**Additional Elective Courses**

085156 XXXX 085851 2 – 3 2.5 XXXX 085852 – 3.0 XXXX – 3.0

**Elective Physics Courses**

Students are required to choose at least 5.10 credits from List 2 and at least two more credits from List 3. Students can choose to do a project.

**List 2**

Le. E. La. C.

116217 XXXX (1st semester) 3 1 – 3.5 (2nd semester) XXXX 3 1 – 3.5 114210 (1st semester) XXXX 3 1 – 3.5 116029 (1st semester) XXXX 116354 3.5 – 1 3 XXXX 116004 116031 XXXX (2nd semester) 5.3 – 1 3

**9**

**List 3**

Le. E. La. C.

114102 0.2 – 2 XXXX 114226 XXXX 1 – 0.1 114227 XXXX 1 – 0.1 116041 XXXX 5.3 – 1 3 3 1 – 3.5 XXXX 116027 116028 XXXX – winter 2 – 0.2 116030 XXXX – spring 0.2 – 2 2 – 2.0 XXXX 116033 2.0 – 2 XXXX 116094 2.5 – 1 2 XXXX 116105 3.0 – 3 1 XXXX 116161 3.0 – 3 1 XXXX 116163 116321 XXXX 3 – 0.3 3.0 – 3 XXXX 117001 3.0 – 3 XXXX 117002 117003 XXXX 3 – 0.3 2.0 – 2 2 XXXX 117004 3.5 – 1 3 XXXX 117006 2.0 – 2 1 XXXX 117010 3.5 – 1 3 XXXX 117015 3.5 – 1 3 XXXX 117016 2.5 – 1 2 XXXX 117018 117021 XXXX 3 – 0.3 3.0 – 3 XXXX 117066 2.5 – 1 2 XXXX 117090 117098 XXXX 3 – 0.3 3.5 – 1 3 XXXX 117140 3.0 – 3 1 XXXX 214301