

# Associate in Science Degree

## ENGINEERING MAJOR PLANNING SHEET

Joliet Junior College

Student Academic Plan 22-23 Catalog (Rev. 04/22)

New Students: Please see ADMITTED STUDENT STEPS prior to registration.

Name: \_\_\_\_\_ Student ID#: \_\_\_\_\_

Major: \_\_\_\_\_ Transfer School(s): \_\_\_\_\_

Catalog Year: \_\_\_\_\_

EGR Advisor: Laura Cotner, email: [LCotner@jic.edu](mailto:LCotner@jic.edu)

Date of Plan: \_\_\_\_\_

<b>Communications</b> <b>9 hours</b> - Must get "C" grades in Eng 101/102	<b>Social Science</b> <b>6 hours</b> - Choose 2 - At least 2 areas are reqd.	<b>Humanities &amp; Fine Arts</b> <b>6 hours</b> Choose 1 course in Humanities & 1 course in Fine Arts	<b>Math</b> <b>4 hours</b> -Engineering requires Calculus sequence	<b>Life &amp; Physical Sciences – 7 hours</b> - Choose 1 Life Science & 1 Physical Science -One course must include a lab	<b>Additional Science and Related courses – 17 hours</b> -Must include 1 additional (4 hr.) math and 1 additional science. Remaining courses must be from the approved list in the JJC catalog.
<p>                             _____ ENG 101* (3) _____                              _____ ENG 102* (3) _____                              _____ COMM 101*3) _____                                Total Hours: _____    <b>Developmental Prerequisites</b>                              _____ Eng 020 (3) _____                              _____ Eng 021 (3) _____                              _____ Eng 022 (2) _____                              _____ Eng 098 (3) _____                              _____ Eng 099 (3) _____    <b>NOTES:</b>                              • An asterisk (*) indicates that the course has a prerequisite or required placement score.                              • Courses whose IAI number ends with an "N" indicate a course that will meet a non-western course requirement. Courses whose IAI number ends with a "D" indicate a course that will meet a diversity requirement. (See reverse side for IAI numbers.)    <b>Graduation Requirements:</b>                              • 2.0 GPA                              • 64 or more approved credit hours                              • 15 hours must be taken at JJC.                              • Apply online to graduate.                              • "0-level" courses do not count for degree.    <b>To complete the requirements for transfer, most engineering students exceed the min. required credit hours for the AS degree.</b> </p>	<p>                             _____ ANTH 101 (3) _____                              _____ ANTH 275 (3) _____                              _____ REC ECON 103 (3) _____                              _____ ECON 104*(3) _____                              _____ GEOG 102* (3) _____                              _____ GEOG 106* (3) _____                              _____ HIST 103 (3) _____                              _____ HIST 104 (3) _____                              _____ HIST 107 (3) _____                              _____ HIST 108 (3) _____                              _____ HIST 260 (3) _____                              _____ HIST 290 (3) _____                              _____ PSCI 101 (3) _____                              _____ PSCI 102 (3) _____                              _____ PSCI 103 (3) _____                              _____ PSYC 101 (3) _____                              _____ PSYC 208*(3) _____                              _____ PSYC 209*(3) _____                              _____ PSYC 210*(3) _____                              _____ PSYC 215*(3) _____                              _____ SOC 101* (3) _____                              _____ SOC 220 (3) _____                              _____ SOC 270 (3) _____                              _____ SOC 280 (3) _____                              _____ SOC 290 (3) _____    <i>Classes struck-out require pre-req. within same area.</i>    <b>REC Recommended: many engineering schools require or highly recommend students have an ECON course.</b>                                Total Hours: _____                 </p>	<p> <b>Humanities</b>                              _____ ENG 103* (3) _____                              _____ ENG 104* (3) _____                              _____ ENG 105* (3) _____                              _____ ENG 106* (3) _____                              _____ ENG 109* (3) _____                              _____ ENG 201* (3) _____                              _____ ENG 202* (3) _____                              _____ ENG 203* (3) _____                              _____ ENG 204* (3) _____                              _____ ENG 208* (3) _____                              _____ ENG 209* (3) _____                              _____ ENG 220* (3) _____                              _____ ENG 221* (3) _____                              _____ ENG 250* (3) _____                              _____ ENG 260* (3) _____                              _____ ENG 270* (3) _____                              _____ HIST 105 (3) _____                              _____ HIST 106 (3) _____                              _____ HIST 200 (3) _____                              _____ PHIL 101* (3) _____                              _____ PHIL 102* (3) _____                              _____ PHIL 103* (3) _____                              _____ PHIL 104* (3) _____                              _____ PHIL 105* (3) _____                              _____ PHIL 106* (3) _____                              _____ SOC 240* (3) _____                              _____ FRCH 104* (4) _____                              _____ SPAN 104* (4) _____    <b>Fine Arts</b>                              _____ ART 109 (3) _____                              _____ ART 115 (3) _____                              _____ ART 116 (3) _____                              _____ ART 117 (3) _____                              _____ ENG 190 (3) _____                              _____ MUS 101 (3) _____                              _____ MUS 102 (3) _____                              _____ MUS 103 (3) _____                              _____ MUS 107 (3) _____                              _____ THEA101 (3) _____                                Total Hours: _____                 </p>	<p>                             _____ MATH 170*(5) _____    <b>See 'Additional Science and Related Courses' for remaining math course requirements for engineering.</b>    <b>Precalculus sequence (MATH 138/139/142) may be required before MATH 170, depending on placement.</b>    <b>Math hours in this group beyond 4 will carry over as 'Additional Science and Related' courses or electives.</b>    <b>Developmental Prerequisites</b>                              _____ Math 090 (3) _____                              _____ Math 094 (4) _____                              _____ Math 098 (4) _____                              _____ Math 095 (4) _____    <i>Verification of Geometry Prerequisite via HS transcripts, placement testing or MATH 095 completion is required for Math 138 and above</i>    <b>NOTE:</b>  <i>Initial math placement is determined by placement test or other approved method.</i>                                Total Hours: _____                 </p>	<p> <b>Life Sciences</b>                      (Underlined and italicized is a non-lab course.)                      _____ BIO 104* (5) _____                      _____ BIO 105* (4) _____                      _____ BIO 106* (4) _____                      _____ BIO 107* (4) _____                      _____ BIO 125* (4) _____                      _____ REC BIO 144* (3) _____                      _____ REC BIO 146* (3) _____                      _____ BIO 149* (4) _____                      _____ BIO 151* (5) _____                      _____ BIO 152* (5) _____    <b>REC Recommended BIO classes for engineering students in non-Bio related discipline.</b>    <b>Physical Sciences</b>                      _____ CHEM 100*(5) _____                      (If needed per HS transcript)                      _____ CHEM 101*(5) _____                      _____ PHYS 201* (5) _____                      _____ PHYS 202* (5) _____    <b>Most engineering majors must complete CHEM 101 and PHYS 201-202 (Engineering Physics) Certain schools and/or disciplines may also require CHEM 102, 209, 210 and/or PHYS 203.</b>    <b>Science hours in this group beyond 7 will carry over as 'Additional Science and Related' courses or electives.</b>                                Total Hours: _____                 </p>	<p>                             _____ MATH 138*, 139* (4 ea.) _____                              or MATH 142* (5) (if needed)                              _____ MATH 171* (4) _____                              _____ MATH 172* (4) _____                              _____ MATH 220* (3) _____                              _____ CHEM, PHYS _____                      (carryover from Sciences) _____    <b>Most engineering majors must complete MATH 170-171-172-220 and PHYS 201-202 for transfer. Certain schools and/or disciplines may also require MATH 137 and/or 210.</b>    <b>Hours in this group beyond 17 will carry over as 'Electives' below.</b>                                Total Hours: _____    <b>Electives- 15 hours</b>  <i>Only electives from the list of courses approved for the AA and AS degree can be used as electives for this degree.</i>    <b>Select electives that fulfill the specific requirements related to your engineering discipline and transfer school such as EGR, PHYS, CHEM, MATH, CIS, etc. Select courses with assistance of advisor.</b>    <b>Carry over hours from the Math and Sciences (and Additional) columns can be used as elective hours.</b>                                _____ Carryover hours from above                              math/science categories: _____                              _____ ( ) _____                              _____ ( ) _____                              _____ ( ) _____                                Total Hours: _____                 </p>

**ASSOCIATE IN SCIENCE DEGREE: Illinois Articulation Initiative (IAI) ([www.itransfer.org](http://www.itransfer.org))**

JJC is a participant in the IAI - an agreement among Illinois colleges and universities to make the transfer of credits as easy as possible. Currently the IAI allows for the transfer of the General Education Core Curriculum (GECC) among the more than 100 participating public and private colleges and universities. Completion of the GECC at any participating community college in Illinois guarantees that transferring students will be granted equivalent credit for the minimum general education program of the receiving four-year college or university. *The AS degree does not fulfill the IAI GECC in the Social Science and Humanities/Fine Arts categories. It is expected that students will complete the remaining 2 courses after transfer.*

**Category I – Communications (9 hrs.)**

ENG 101 - Rhetoric (C1 900)  
ENG 102 - Rhetoric (C1 901R)  
COMM 101 - Principles of Speech (C2 900)

**Category II – Social and Behavioral Science (6 hrs.)**

**Complete 2 courses from different subject areas.**

ANTH 101 - Introduction to Anthropology (S1 900N)  
ANTH 275 - Cultural Anthropology (S1 901N)  
ECON 103 - Principles of Economics I (S3 901)  
ECON 104 - Principles of Economics II (S3 902)  
GEOG 102 - World Regional Geography (S4 900N)  
GEOG 106 - Cultural Geography (S4 900N)  
HIST 103 - History of the US to 1865 (S2 900)  
HIST 104 - History of the US 1865 to Present (S2 901)  
HIST 107 - World History to 1500 (S2 912N)  
HIST 108 - World History since 1500 (S2 913N)  
HIST 260 - History of the Middle East (S2 918N)  
HIST 290 - History of Africa (S2 906N)  
PSCI 101 - American National Government (S5 900)  
PSCI 102 - American State and Local Government (S5 902)  
PSCI 103 - Intro. to Comparative Government (S5 905)  
PSYC 101- General Psychology (S6 900)  
PSYC 208 - Social Psychology (S8 900)  
PSYC 209 - Child Psychology (S6 903)  
PSYC 210 - Adolescent Psychology (S6 904)  
PSYC 215 - Life Span: A survey of Human Development (S6 902)  
SOC 101 - Introduction to Sociology (S7 900)  
SOC 220 - Sex, Gender, and Power (S7 904D)  
SOC 270 - Marriage and the Family (S7 902)  
SOC 280 - Sociology of Social Problems (S7 901)  
SOC 290 - Cultural Diversity in America (S7 903D)

**Category III – Humanities/Fine Arts (6 hrs.)**

**Select one course from the Humanities list and one course from the Fine Arts list. List continues in the next column.**

**HUMANITIES**

ENG 103 - American Literature (H3 914)  
ENG 104 - American Literature (H3 915)  
ENG 105 - Survey of English Literature (H3 912)  
ENG 106 - Survey of English Literature (H3 913)  
ENG 109 - Children's Literature (H3 918)  
ENG 201 - Introduction to Poetry (H3 903)  
ENG 202 - Introduction to Fiction (H3 901)  
ENG 203 - Introduction to Drama (H3 902)  
ENG 204 - Introduction to Literature (H3 900)  
ENG 208 - Masterpieces of Western Civilization (H3 906)  
ENG 209 - Masterpieces of Western Civilization (H3 907)  
ENG 220 - Non-Western Literature in Translation (H3 908N)  
ENG 221 - Literature of Asia (H3 908N)  
ENG 250 - Introduction to Shakespeare (H3 905)  
ENG 260 - Minority American Literature (H3 910D)  
ENG 270 - Introduction to Women Writers (H3 911D)  
FRCH 104 - Intermediate French II (H1 900)  
HIST 105 - History of Civilization I (H2 901)  
HIST 106 - History of Civilization II (H2 902)  
HIST 200 - History of Great Britain since 1688 (H2 908)  
PHIL 101 - Introduction to Philosophy (H4 900)  
PHIL 102 - History of Philosophy (H4 901)  
PHIL 103 - Introduction to Ethics (H4 904)  
PHIL 104 - Introduction to Logic/Critical Thinking (H4 906)  
PHIL 105 - Contemporary Moral Issues (H4 904)  
PHIL 106 - Philosophy of Religion (H4 905)  
SOC 240 - Introduction to Comparative Religion (H5 904N)  
SPAN 104 - Intermediate Spanish II (H1 900)

**FINE ARTS**

ART 109 - Introduction to the Visual Arts (F2 900)  
ART 115 - Intro to Ancient/Medieval Art (F2 901)  
ART 116 - Intro to Renaissance & Baroque Art (F2 902)  
ART 117 - Introduction to Modern Art (F2 902)  
ENG 190 - Introduction to Film Study (F2 908)  
MUS 101 - Exploration of Music Literature (F1 900)  
MUS 102 - Exploration of American Music (F1 904)  
MUS 103 - Evolution of Jazz (F1 904)  
MUS 107 - Music in World Cultures (F1 903N)  
THEA 101 – Theatre Appreciation (F1 907)

**Category IV – Physical and Life Sciences (7 hrs.)**

**Must include one life science and one physical science. One course must be a laboratory course.**

**LIFE SCIENCES**

BIO 104 - Biological Diversity (L1 900L)  
BIO 105 - Microbes and You (L1 903L)  
BIO 106 - Animals and Society (L1 902L)  
BIO 107 - Plants and Society (L1 901L)  
BIO 125 - Human Biology (L1 904L)  
BIO 144 - Introduction to Human Heredity (L1 906)\*  
BIO 146 - Environmental Biology (L1 900L)\*  
BIO 149 - Principles of Biology (L1 900L)  
BIO 151 - General Biology I (L1 910L)  
BIO 152 - General Biology II (L1 910L)

**\* Denotes non-lab sciences**

**PHYSICAL SCIENCES**

ASTR 101 - Descriptive Astronomy (P1 906)\*  
CHEM 100 - Fundamentals of Chemistry (P1 903L)  
CHEM 101 - General Chemistry I (P1 902L)  
CHEM 104 - Chemistry and Society (P1 903)\*  
GEOG 111 - Phys. Geography Weather & Climate (P1 909L)  
GEOG 112 - Phys. Geography Landforms (P1 909L)  
GEOL 101 - Principles of Physical Geology (P1 907L)  
PHSCI 125 - Life in the Universe (P9 900)\*  
PHYS 100 - Basic Physics (P1 900L)  
PHYS 110 - Physics of Sound, Music, & Hearing (P1 901L)  
PHYS 101 - General Physics I (P1 900L)  
PHYS 201 - Engineering Physics 1 (P2 900L)

**\* Denotes non-lab sciences**

**Category V – Mathematics (4 hrs.)**

MATH 128 - Elementary Statistics (M1 902)  
MATH 137 - Introduction to Discrete Mathematics (M1 905)  
MATH 150 - Mathematics Analysis for Business (M1 900B)  
MATH 153 - Finite Mathematics (M1 906)  
MATH 170 - Calculus with Analytical Geometry I (M1 9001)  
MATH 171 - Calculus with Analytical Geometry II (M1 9002)  
MATH 172 - Calculus for Analytical Geometry III (M1 9003)

## ENGINEERING MAJORS INFORMATION *(see next page for discipline specific information)*

**MATH:** PLACEMENT: Your math placement can be done through HS GPA, SAT/ACT scores, or any additional measures approved-see Admitted Students: Placement Records section on JJC website. These placement methods can only place you into MATH 138 or 142 (Precalculus sequence) at the highest. You may also take the ALEKS placement exam. To start at a higher level in math, such as MATH 170 Calculus I, you must take the ALEKS placement test.

**REQUIRED MATH sequence for Engineering transfer: MATH 170-171-172-220 (+210 or 137 for some disciplines/transfers)**

Notes:

- MATH 142 is an accelerated course for students who already had pre-calculus and trigonometry. It is not intended for students learning the material for the first time.
- Engineering students are recommended to begin their math course sequence their first semester at JJC.
- AP credit or transfer college math credit must be submitted to JJC for evaluation and placement into the next sequential math course.

**SCIENCES:** To meet transfer and AS degree requirements, all engineering disciplines are required to complete Science courses in General Chemistry, Engineering Physics, and Biology. Certain disciplines and/or transfer schools may require additional study in the Sciences. Science courses have a placement level of ENG 101 and specific MATH pre-requisites for the course.

**CORE SCIENCES for Engineering transfer: CHEM 101, PHYS 201 and 202, BIO xxx**

**CHEMISTRY:** Engineering majors are required to complete CHEM 101. If you did not have Chemistry in high school, you will also need to take CHEM 100 prior to 101. Each has a specific math pre-requisite. Some engineering disciplines and specific transfer schools may require CHEM 102. (+CHEM 209, 210 for chemical engineering).

**PHYSICS:** Engineering majors must take Engineering Physics, PHYS 201 and 202. Some engineering disciplines and specific transfer schools may require PHYS 203. The math prerequisite for PHYS 201 is MATH 170 Calculus I. There are no 100 level Physics pre-requisites - engineering students start at PHYS 201.

**BIOLOGY:** To fulfill the AS degree requirement, select from the list of approved BIO classes. Engineering majors do not generally need advanced levels of Biology unless majoring in Bioengineering or a related discipline. Note: A non-lab Biology such as BIO 144 or BIO 146 is recommended. *BIO 146 Environmental Biology is preferred learning for engineering students.*

### **GRADES and COURSE LOAD:**

The transfer options available for engineering majors are typically very competitive, so a high GPA is desirable to present a competitive application. Certain engineering transfer schools (such as UIUC) are more competitive and require not just a high GPA, but also evidence of academic rigor and completion of the minimum core requirements and additional courses specific to the discipline.

Achieving higher grades (A or B) in science and math classes requires a high level of dedication to course requirements and outside class studying time. A student can expect to spend 2-3 hours outside of class studying for every hour in class.

For example:

PHYS 201: 5 credits (7 contact hours) = **Total Time** of 21-28 hours a week.

MATH 170: 5 credits (5 contact hours) = **Total Time** of 10-15 hours a week.

**IMPORTANT NOTE: To complete all the required core courses and maintain a competitive grade point average, some students will require more than two (2) years to complete the degree and transfer requirements that include the math and science sequences, general education, and discipline electives.**

**See JJC website: STUDENT RESOURCES for assistance: Testing Services, Student Advising Center, Transfer Information, Tutoring, etc.**

## ENGINEERING DISCIPLINE SPECIFIC MAJORS and COURSE PLANS

When students transfer to a four-year university engineering program, they are typically required to select a discipline of study. Not all colleges have all engineering disciplines, and the student should research their desired transfer schools to find the program/discipline to meet their goals.

In addition to the core General Education, Math and Science coursework, students can also select additional courses specific to their discipline and/or transfer school. The selections available at JJC are listed below for the more common disciplines. In doing so, most engineering students exceed the min. required credit hours for the AS degree.

### Engineering Discipline Specific Majors and Electives:

- ALL DISCIPLINES: An optional course, EGR 105 Intro to Engineering, is offered for students to explore the profession and major of engineering and to explore the various disciplines. This course is geared for students that are undecided about pursuing engineering or would like to learn more.
- Physical Engineering Disciplines: Mechanical, Civil, Structural, Aero, Industrial, etc. Engineering:
  - Recommended: EGR 101 Graphics, EGR 201 Statics (prereq: PHYS 201), EGR 202 Dynamics
- Computer/Electrical Engineering Disciplines:
  - A sequence in CIS courses may be required/recommended:
    - Recommended: CIS 122 Fundamentals, CIS 135 Intro to Programming
    - Optional programming language(s) dependent on transfer school: CIS 230 Visual Basic, CIS 236 Programming In C, CIS 246 Programming in C++, CIS 261 Java, CIS 269 Data Structures
    - Electrical: EET 113 Electrical Circuits (note: this is an introductory course-an Engineering Circuits course will be required upon transfer)
- Chemical Engineering Disciplines:
  - Chemistry sequence recommended: CHEM 101, 102, 209, 210
- Computer Science: Transfer programs in Computer Science vary widely between transfer schools. Some programs are engineering based; others are software programming based. The student shall determine which pathway best meets their goals so they can be advised based on the specific Computer Science pathway.

### EXAMPLE COURSE SEQUENCE: ENGINEERING MAJORS

FALL Y1		SPRING Y1		SUMMER Y1		FALL Y2		SPRING Y2		SUMMER Y2	
COURSE	HRS	COURSE	HRS	COURSE	HRS	COURSE	HRS	COURSE	HRS	COURSE	HRS
MATH 138	4	MATH 139	4	MATH 170	5	MATH 171	4	MATH 172	4	MATH 220	3
CHEM 101	5	BIO XXX	3			PHYS 201	5	PHYS 202	5		
ENG 101	3	ENG 102	3			COMM 101	3	ELECTIVE 2	3-5	(ELECTIVE)	
GE 1	3	ELECTIVE 1	4	GE 2	3	GE 3	3	GE 4	3		
	Total 15		Total 14		Total 8		Total 15		Total 15		Total 3
								TOTAL HOURS	64-70 hours		

#### Notes:

- The suggested course sequences shown are for the student who places into the Precalculus sequence (MATH 138). If prerequisite MATH courses are required, the course plan must be modified to accommodate the additional courses as well as science courses due to pre-requisites. For students placing directly into MATH 170 Calculus I in the first semester, the course plan may be adjusted to eliminate some summer courses.
- Students have the option to extend the course plan beyond two academic years.
- ELECTIVE 1: This course is the intro level course for students to explore the various discipline fundamentals and should be taken within the first two semesters for exploration and/or to be the foundation to continue the additional discipline specific coursework. These courses are indicated as underlined above (EGR 105, EGR 101, CIS 122, CIS 135, EET 113). Additional electives are noted per discipline above.
- GE: Gen Ed – 4 classes required: Social Science (2), Humanities (1), Fine Arts (1). GE’s can be taken in any semester in any order.