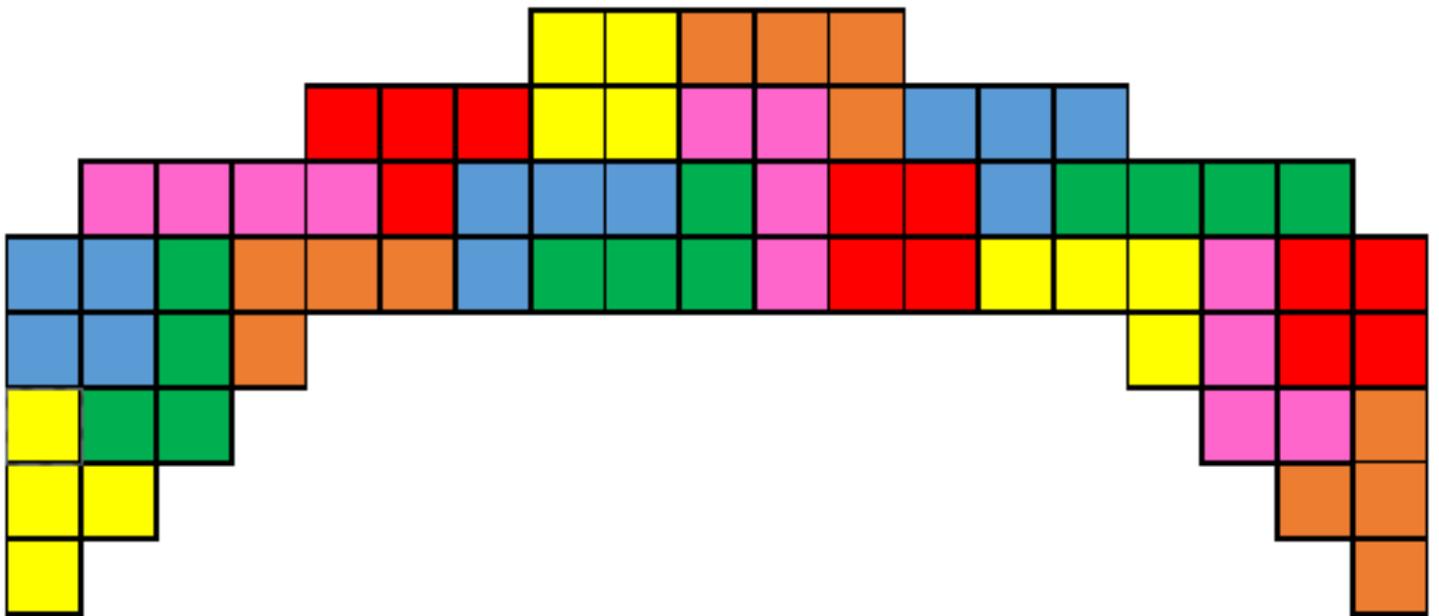


# Summer Arch

## School of Engineering Guide



August 2016



Rensselaer

This **Summer Arch** guide is intended to help students understand the Summer Arch option being offered in the summer of 2017.

### **Summer Arch, what is it?**

Summer Arch is a restructuring of the Rensselaer academic calendar that will create exciting opportunities for experiential learning (through co-ops, internships, research, civic engagement, travel abroad, and more) to better prepare Rensselaer students for 21<sup>st</sup> century technological careers, as well as graduate or professional school. As a Summer Arch participant you will

- Spend the summer following your sophomore year on campus in an immersive small-group learning environment taking courses towards your degree and participating in co- and extra-curricular activities.
- Spend a semester during the junior year away from campus pursuing valuable personal and professional experiential opportunities: co-ops, internships, research, entrepreneurship, study/travel abroad, and service activities.

### **Benefits**

- An exciting opportunity for experiential learning that prepares you for future career and allows you to explore your professional and personal passions.
- A unique summer semester that includes exciting co-curricular activities including trips to local companies, exploration of the Adirondacks and local culture, and more.
- Enhanced access to faculty and staff, smaller student to faculty ratios.

***Co- and extra-curricular activities planned for Summer Arch 2017:***The Innovators in Engineering Series

Engineering entrepreneurs will come to campus to spend time visiting with students in a workshop environment to share personal and professional experiences that helped them form successful companies or innovate within a larger corporation.

Enhanced Interactions with Faculty and Staff

Pop-Up Courses by faculty and staff to introduce and teach a unique subject in a few hours (e.g. Electron Microscopy, Basics of Motors, Etiquette for Business Meals, Indian Music, My Time In a Rock n Roll Band).

Lunch or excursions with a faculty member.

Trips to local companies for in behind-the-scenes tours / special workshops at Rensselaer facilities:

General Electric Power Generation, Global Foundries Processing Facility, Ecovative, Intermagnetics General, Adirondacks for field experiences, etc.

Local Social Events

Rock Concerts at SPAC, Tanglewood, EMPAC, Hikes with Profs, Lake George.

And more...



## Summer Arch Course Offerings (Engineering and Science)

For engineering templates see: <http://provost.rpi.edu/summer-arch/curricular>

Full class schedule will be posted on SIS on September 10, 2016. Please register your interest in Summer Arch on SIS from mid-September through November of 2016.

### **School of Engineering**

BMED 4010	BME Laboratory
BMED 4200	Modeling of Biomedical Systems
CHME 4010	Transport Phenomena I
CHME 4030	Chemical Process Dynamics Control
ECSE 2010	Electric Circuits
ECSE 2050	Introduction to Electronics
ECSE 2100	Fields and Waves I
ECSE 2410	Signals and Systems
ECSE 2500	Engineering Probability
ENGR 1100	Introduction to Engineering Analysis
ENGR 1200	Engineering Graphics and CAD
ENGR 1300	Engineering Processes
ENGR 1600	Materials Science for Engineers
ENGR 2050	Introduction to Engineering Design
ENGR 2090	Engineering Dynamics
ENGR 2250	Thermal and Fluids Engineering I
ENGR 2300	Electronic Instrumentation
ENGR 2350	Embedded Control
ENGR 2530	Strength of Materials
ENGR 2600	Modeling and Analysis of Uncertainty
ENGR 4010	Professional Development III
ENGR 4760	Engineering Economics
ISYE 4140	Statistical Analysis
ISYE 4600	Operations Methods Research
MANE 4010	Thermal and Fluids II
MANE 4020	Thermal and Fluids Laboratory
MANE 4030	Elements of Mechanical Design
MANE 4050	Modeling and Control of Dynamic Systems
MANE 4060	Aerospace Structures and Materials
MANE 4070	Aerodynamics I
MTLE 4100	Thermodynamics of Materials
MTLE 4250	Mechanical Properties of Materials
MTLE 4xxx	Skills in Materials Engineering

**School of Science**

BCBP 4760	Molecular Biochemistry I
BIOL 1010	Introduction to Biology
BIOL 1015	Introduction to Biology Lab
BIO 2500	Genetics and Evolution
BIO 4760	Molecular Biochemistry I
CHEM 1100	Chemistry I
CHEM 1200	Chemistry II
CHEM 2230	Organic Chemistry I Lab
CHEM 2240	Organic Chemistry II Lab
CHEM 2250	Organic Chemistry I
CHEM 2260	Organic Chemistry II
CHEM 4760	Molecular Biochemistry I
CSCI 1100	Computer Science I
MATH 1010	Calculus I
MATH 1020	Calculus II
MATH 2010	Multivariable Calculus and Matrix Algebra
MATH 2400	Introduction to Differential Equations
MATH/CSCI 4800	Numerical Computing
PHYS 1100	Physics I
PHYS 1200	Physics II

**Humanities, Arts, and Social Sciences**

ARTS 1XXX	Art History
ARTS 1961	Deep Listening
ARTS 296X	Site Specific Sculpture
LANG 1410	Chinese I
LANG 2420	Chinese III
WRIT 1110	Writing for Classroom and Career
WRIT 2310	Creative Writing: Poetry
WRIT 2320	Creative Writing: Non Fiction
WRIT 2330	Creative Writing: The Short story
WRIT 2340	Speech Communication
COMM 4880/6880	Interactive data visualization
PHIL 2100	Critical Thinking
PSYC 1200	General Psychology
PSYC 2730	Social Psychology
PSYC 2962	Positive Psychology
PSYC 4310	Research Methods & Stats II
PSYC 4370	Cognitive Psychology

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PSYC 4400	Personality
PSYC 4960	Mindfulness
ECON 1200	Introductory Economics
ECON 2010	Intermediate Microeconomic theory
ECON 4130	Money and Banking
COMM 1600	History and Culture of Games
COMM 296x	Must See Films for Game Design
COMM 496x	Video Game Level Design
ARTS 496x	Virtual Reality Studio
ARTS 496x	Animation Workshop
COGS 2520	Intro to Game Design
COGS 2961	Intro to Game Programming
STSS 4120	How to Read the NY Times
STS/H 4XXX	In Culture: A
STS/H 4XXX	In Culture: B
STS/H 4XXX	In Culture: C
STS/H 4XXX	In Culture: D
STS 4270	Sustainability Problems
STSH/S 4XXX	PDI Summer Sustainability Studio
STSH/S 1110	Public Service Internship
STSH/S 4XXX	Professional Development II

## Summer Arch Frequently Asked Questions

### FAQ -- ACADEMICS & CO-CURRICULAR ACTIVITIES

- **When will the Summer Arch option be offered?**

The School of Engineering and the Lally School will offer the first Summer Arch option in the summer of **2017** for the class of 2019. All schools at Rensselaer will offer a Summer Arch option in summer 2018 (for the class of 2020). Beyond this point, Summer Arch will be a required experience for all Rensselaer students. E.g., students in the Class of 2021 will be required to participate in the Summer Arch program in summer 2019.

- **What does the Summer Arch calendar look like?**

Courses will be offered in a mixture of 6-week and 12-week modes, with class times throughout the day. Wednesdays are nominally reserved for co- and extra-curricular activities as well as for studying. There will be no courses offered on Saturday or Sunday, although co-curricular/fun activities (e.g., an optional hike with a faculty member) may be planned on a weekend.

- **What co/extra-curricular activities are available?**

The School of Engineering will be offering an exciting set of activities in the Summer Arch, including special seminars, workshops, field trips, and exploration tours, etc. Indeed, summer offers many ways to engage across the greater Hudson Mohawk Region and beyond, through unique multicultural events, and experiences. The [Rensselaer Union](#) will also expand the capacity of existing summer programs and services. This includes, but is not limited to, intramurals, fitness classes, movies, food festivals, and promotion of area summer festivals and destinations. The student jazz ensemble established during summer 2015 will continue. In addition, the [Mueller Center](#) is developing a robust summer outdoor recreation program such as hiking, rock climbing, kayaking, and camping.

- **What will be the average class size?**

We anticipate a significantly smaller class size, and smaller student-to-faculty ratios in the Summer Arch courses. Depending on the major, most classes will likely be capped at 30 seats.

- **Will the clubs continue?**

Clubs can continue to operate through the summer.

## FAQ -- DORMS, CLASSROOMS, FOOD, ETC.

- **Will I be staying in the residence halls?**

Yes, students are required to stay in the residence halls.

- **Will there be air conditioned residence halls and classrooms for all students during the Summer Arch?**

There is an AC plan in place so that all Summer Arch students will be in air conditioned residence halls (and air conditioned classrooms and laboratories).

- **What are the dining options?**

Yes, there will be dining options open around campus (Commons, McNeil room, etc.). An innovative dining experience will bring students, faculty, and staff together to engage in academic conversations and socialize.

## FAQ -- EXPERIENTIAL LEARNING/AWAY SEMESTER

- **Will I go “away” in Fall or Spring of the junior year?**

This depends on your major and/or preference. In some programs, you will have options to go away in either term. Some terms may be better for the away term depending on availability of and your preferred away experience.

- **Does this mean it will take more than four years to graduate?**

No – as usual, engineering students can still graduate in four years. With the exception of students in the five-year bachelor of architecture program, matriculation to degree completion is not intended to take more than eight terms at Rensselaer. To accelerate your academic progress, and graduate in fewer than eight semesters, you may take classes elsewhere prior to enrollment at Rensselaer, obtain AP/IB credit from high school, take summer courses in subsequent summers, study abroad during the away semester, or some combination of these options.

- **What will I do on my semester “away” from Rensselaer?**

You can take advantage of numerous co-curricular and experiential activities available off campus, including international travel, internships, co-ops, research opportunities, and engagement in government or community service projects.

- **Will I have help in finding a co-op or internship?**

Yes, the Center for Career and Professional Development will continue to provide programming and resources to assist students in their search for co-op and internship opportunities. Students seeking Abroad Experiences will work with the Office of International Programs. Once you elect to participate in the Summer Arch pilot, you will be notified of CCPD programming that you should attend to better prepare for your search and your semester away. You are also encouraged to attend to the CCPD’s Summer Arch programming this fall – details will be available on JobLink and via the CCPD’s weekly newsletter.

The CCPD will also host Walk-In hours in the SoE HUB each Thursday from 2 to 4 p.m. Please drop in for a quick review of your resume or cover letter, to get interviewing tips, or discuss how to best prepare for your semester away.

- **During the “away semester”, can I go away to another university for a semester and transfer credits? Can I accelerate my degree?**

Yes, but see below regarding financial aid.

- **Will a research intensive experience on the Troy campus count as the “away” semester?**

One goal of the Summer Arch initiative is to enhance experiential learning through a variety of opportunities away from the campus. Therefore, we encourage a truly away experience. For research experiences on campus that include about a month of time in a collaborator's laboratory off campus and the opportunity to attend a national/international meeting in your field, an exemption can be requested from the Office of Undergraduate Education.

- **What if I want to study abroad?**

Study abroad has become an integral part of a well-rounded undergraduate experience. The Summer Arch provides additional experiential learning opportunities for students to gain a greater understanding and appreciation of other cultures and customs. This includes short-term and faculty-led international programs, and other international experiences such as internships and service learning.

Formal study abroad through our exchange programs would not be considered an away semester as students' pay Rensselaer tuition.

Students can, however, also pursue study abroad during their away semester through non-affiliated programs. In that case students pay tuition to the host institution.

- **Do I have to pay tuition during my "away" semester?**

No. The semester away is an opportunity to pursue internships, co-ops, and collaborative research, as well as athletic, entrepreneurial, philanthropic, and community service activities.

## FAQ -- FINANCIAL AID

- **Will financial aid be available for the Summer Arch semester?**

Federal, NY State, and Rensselaer financial aid will be available as long as you meet eligibility requirements. The Summer Arch semester is like any other semester – you attend full-time.

- **Will I get the same amount of financial aid in the Summer Arch semester as I would if I was attending a standard academic year (i.e. fall/spring)?**

Yes, in theory. However, need based aid is determined by your Cost of Attendance. The Summer Arch semester is shorter in length than the fall or spring semester, so your expenses for the summer semester might be less which may mean less need based aid. Every attempt will be made to allow you to have as much financial aid as possible and renew awards you currently would have prior to your Summer Arch semester. Merit based awards are never impacted.

- **When should I apply for financial aid (i.e., file my FAFSA)?**

We will be providing a timetable for students planning on attending the Summer Arch semester to complete the Free Application for Federal Student Aid (FAFSA). It will be earlier than our normal April 1st deadline because we need to be able to review your FAFSA data and create a financial aid package for you prior to the start of your Summer Arch semester so your family can plan appropriately. It will be important for you to submit any information that the Office of Financial Aid requests from you as quickly as you can. You should also check your financial aid status using your SIS access to see if there are any outstanding requirements you may need to submit to us so that an aid package can be created for you.

- **I'm not interested in any federal or state financial aid. Do I still need to complete the FAFSA?**

If you just have Rensselaer merit awards (i.e., Rensselaer Leadership Award, Rensselaer Medal Award, Rensselaer Recognition Award) and are not interested in federal or state aid then you do not need to complete the FAFSA. However, if you have Rensselaer need-based grants (i.e., Rensselaer Grant, Rensselaer Access Grant, President's Assistance Grant) and you wish to be considered for renewal of these awards then you must complete the FAFSA even if you are not interested in federal or state financial aid.

- **Is financial aid available for my away semester?**

If you are doing a co-op, you are presumably getting paid sufficient amount by the company. As for financial aid, only federal aid is potentially available. In most cases, it is expected that students participate in experiential learning experiences that do not include taking classes. Therefore, using federal aid during the away semester is generally discouraged. Calculations of

federal aid available to each student are based on need per academic year. If the aid is used during the away semester, less will be available during the two semesters on campus.

You cannot use Federal Work Study during your away semester. You must be taking at least six credits at RPI, or participating in an approved co-op, or an approved study abroad program to qualify for federal financial aid. To note, credit-bearing internships do not count because students are not able to receive Rensselaer credits during the away semester unless an exception is being considered.

## FAQ -- CO-OP

- **What is a co-op? And how does it differ from an internship?**

A co-op is a full-time, paid position directly related to a student's field of study. At Rensselaer, co-op entails both a summer and a semester experience – the two experiences do not need to be consecutive nor do they have to be with the same employer. An internship can be full-time or part-time, paid or unpaid. For purposes of the Summer Arch Semester Away, academic credit cannot be earned for internships and students must work a minimum of 20 hours per week for a minimum of 10 weeks. Please speak with a Career Counselor to get more details.

- **What are the requirements for the Co-op Program?**

- A minimum 2.0 GPA and good academic standing.
- Complete the first year of studies before applying or have at least one semester of study (12 credits) remaining before graduation
- Attend a "Co-op Briefing" after accepting a position; register on JobLink
- Write a 2-4 page "work report" at conclusion of co-op term(s); if multiple co-ops are completed, you are only required to write one report.
- Note: You are only required to attend one briefing, regardless of how many times you co-op.

- **How will I find a job?**

Most applicants find their job through the co-op program or one of the career fairs. However, you may also search for a job on your own. If you pursue a job on your own, the position should be cleared with the CCPD before accepting. If you are having difficulty finding job leads, please make an appointment with a Career Counselor or stop by the CCPD during Walk-ins. .

- **How do I apply?**

Activate your account on JobLink, post your resume, and indicate the terms that you are applying for the program in the "Academic" section of your Profile. This will enable you to participate in on-campus recruiting activities and to submit resumes.

- **Can I get academic credit for Co-op?**

Currently, no academic department offers academic credit for co-op. While credit is not given, your Co-Op experience will be noted on your transcript with an S or U as a grade earned depending on your completion and submission of the required Work Report.

- **What do I do about medical insurance while on Co-op?**

While on co-op, you have the option of taking the insurance through your family or signing up for the Student Accident and Sickness Insurance policy (which must be done by September 15 each year!). If you live within 25 miles of campus, you will automatically be charged the Student Health Center fee and may use the Health Center as though you were taking classes.

- **What do I do about housing and transportation while I am on Co-op?**

Although you are ultimately responsible for finding housing and transportation, your co-op employer may assist you in the housing search. During your co-op interviews, it is appropriate to ask if the employer offers assistance in finding housing and if you will need a car as transportation to work. A career counselor will also be happy to provide advice on securing housing.

- **Could Co-op affect my Financial Aid?**

There is no guarantee your co-op earnings will not impact your financial aid package. Potentially any aid except merit awards could be impacted. Please see the Co-op Guide or the 'Financial Aid & Co-op' handout for more detailed information.

- **May I walk with my class during May Commencement ceremonies if I graduate in December because of Co-op?**

Undergraduate students who have participated in the Co-op program and are in good academic standing, with no more than 12 credit hours remaining towards completion of their degree(s), can petition the Office of the Registrar for permission to participate in the commencement exercises, but will not receive their diploma.

## Co-op in Engineering

<https://www.rpi.edu/dept/cdc/students/experience/coop/index.html>

Engineering students have worked for over 200 companies for co-ops and internships. The average salary for engineering students is over \$20 per hour but is dependent on major and class year.

The following is a sample of companies Rensselaer engineering students have had co-ops with.

Advanced Testing Laboratory	IBM
Amazon	Intel
American Airlines	Jet Propulsion Laboratory
Apple	Johnson & Johnson
Applied Materials	Keurig Green Mountain
Ashcroft, Inc.	Microsoft
Atlantic Testing Laboratories	MIT Lincoln Laboratory
BD Diagnostics	Moog
Becton Dickinson	Motorola Solutions
Boeing	NASA
Bose Corp.	Paradigm Precision
Bristol Myers Squibb	PepsiCo
Chicago Bridge & Iron	Philips
Cisco Systems Inc.	Pratt & Whitney
Corning Inc.	Regeneron Pharmaceuticals
Covidien	SABIC Inc. Plastics
Disney Worldwide Services	Sandia National Labs
Energizer/Playtex	Schick
Ethicon	Siemens Corp Research
ExxonMobil	Sikorsky
General Dynamics	SpaceX
General Electric	Stryker Orthopedics
Global Tungsten & Powders Corp.	UTC Aerospace
GLOBALFOUNDRIES	Vicor Corp.
Hamilton Sundstrand	Vital Vio
Hasbro	XL Group
Honda	