Department of Mathematics  
SIP Guide

General Information
The Senior Individualized Project is an opportunity for you to create a unique learning experience that draws on all the academic and experiential aspects of your Kalamazoo education. Whether you decide to work on campus or off, you should enlist a SIP advisor from the department in which you are doing your SIP and discuss your ideas with that person early in the planning phase. You should develop a SIP proposal, obtain the approval of your faculty SIP advisor, and file a SIP contract with the department in which you are doing your SIP before the end of spring quarter.

The SIP does not count toward the eight courses in a Mathematics major.

Who?
Most students doing SIPs in the department are Math majors; not all Math majors choose to do a Math SIP. You may do a SIP in any department of the College if you have the support of a faculty SIP advisor in that department.

What and Where?
Most Math SIPs are either experiential SIPs or research SIPs. Students doing research SIPs generally participate in a Research Experiences for Undergraduates (REU) program, work at a national lab such as Argonne National Laboratory, or conduct research with one of the faculty on campus, and then write a research paper. Students doing experiential SIPs work at a company or government laboratory or agency and then write a paper relating theory to practice. The SIP paper should include further research into some aspect or extension of the project that the student finds interesting. All students doing Math SIPs also give an oral presentation of their work after it is complete.

The style and structure of your SIP paper will depend on the type of SIP you choose to do. Experiential SIP reports consist of two major sections, a general discussion of the topic and its role in the field of mathematics, and a more specific discussion of the work you did and how that fits into the mission of the organization you worked for. Research SIP reports follow the traditional structure for research papers in the discipline. You should work out the specific structure of your research paper with your on-campus SIP advisor.

When?
Math SIPs are generally two-unit SIPs. In some cases, one-unit SIPs are permissible. If you would like to do a one-unit SIP, you should speak to a member of the department early in the planning phase. (See the section on exceptions below.)

Students doing two-unit SIPs complete the experiential or research portion of their work during the summer and write their SIP reports during the fall. Thus, you should register for one SIP unit for the summer and one SIP unit for the fall. The fall SIP unit includes the SIP seminar described below. In addition you may register for either one or two classes during the fall quarter. Two classes plus the fall SIP constitutes a full load; students are not allowed to overload during a SIP quarter, so you may not register for three classes and a SIP in the fall.
Seniors working on their SIP papers participate in a weekly SIP seminar during the fall quarter to report progress, share ideas, analyze and critique outlines and drafts, and generally help each other develop a high-quality, personal report of their unique experiences. By the end of the fall quarter all SIP write-ups should be completed; the final reports are due on the first day of winter quarter. During the fall students also design a presentation of their work (which will generally be given in the spring quarter) and/or a poster session. Full participation of every student in the seminar is critical to the success of this program.

Exceptions
The SIP structures described above are general guidelines for Mathematics SIPs. Students wishing to split a SIP between two departments should speak to faculty members in each department early in the planning phase. Other exceptions, including the option of doing a one-unit SIP, will be handled on a case-by-case basis. An approved one-unit SIP might, for example, consist of doing special coursework, writing an expository paper, or doing an experiential project with a shorter SIP write-up.

In all cases, you should speak with a member of the department early enough to be able to make plans and consider alternatives.

Planning
You should start researching SIP opportunities by the fall of your junior year. Application deadlines for most REU programs and research programs at government labs and agencies are during the winter term. If you are planning to study abroad during your junior year, you should start researching SIP opportunities before you go abroad and should expect to be applying for off-campus opportunities while abroad. Information about the opportunities at the national labs and at REU programs can be found on the department website. The best resources for finding out about experiential SIP opportunities are the Career Development Center, family and friends, and current seniors and recent alumni.

You should choose and meet with your faculty SIP advisor during the spring quarter of your junior year. You must agree on the SIP proposal, on any preparation that will be necessary before the summer SIP quarter begins, on the type and frequency of communication you will have with your local advisor while you are off-campus, and on requirements and deadlines for your SIP.

Deadlines and Requirements
Junior Spring: You should enlist a faculty advisor and develop a SIP proposal to be filed with the department before the end of spring quarter. Your SIP proposal should address the following basic questions:

• Where will you be working, and what project (topic) will you be working on?
• (Research SIPs) What question or problem are you trying to address, and how do you propose going about it?
• (Experiential SIPs) Why is the company you will be working for interested in this project?
• Why would the broader Math community be interested in this project? How does the project fit into the broader Math world?
• What will be the theme that will run through and provide structure for your paper?
• (Experiential SIPs) What aspect or extension of the project would you find interesting to research further for your paper?
You may choose to have the “project” mentioned in these questions refer to the specific work that you will do during the summer or to something larger in the scope of which your work is a part.

If you will be working off-campus, you should provide the name, address, email address, and telephone number of your off-campus supervisor to your faculty SIP advisor at the start of your off-campus work.

**Summer:** As you do your work, keep your topic and theme in mind, and be working to develop a thesis for your paper. Jot down notes to yourself as you encounter problems, develop solutions and see connections with other things. These notes will be a valuable resource to you when you write the SIP paper. You should also begin your library research on the interesting aspect/extension you chose earlier. Take advantage of the contacts that you have at your job or research site: ask them to suggest good books and articles on the topic, and go to them with things you don’t understand from the readings.

Midway through the summer, you should send a revised topic and theme to your on-campus SIP advisor as well as a preliminary thesis, a report on your library research, and a first-pass outline of your paper.

By the end of August, you should send your on-campus SIP advisor an updated report on your library research and a detailed outline of your paper. If you are doing an experiential SIP, you should also send a draft of the section(s) of your paper talking about what you did for your project, the company or organization that you worked for, and why the organization is interested in the project. If you are doing a research SIP, you should communicate with your on-campus SIP advisor about which section(s) of your paper you should focus on at this point.

**Senior Fall:** During the fall quarter, Math SIP students participate in the SIP Seminar, if available. Participation is required for all two-unit SIPs, so be sure that you do not have conflicts with its meeting time. The main focus of the seminar is to engage in peer-review of your SIP paper as it develops, although students also review posters and presentations of their SIPs, resumes, and graduate school applications.

Intermediate deadlines for SIP reports will be announced in the Seminar. You should submit a final draft of your SIP paper to your SIP advisor by the end of the quarter; finished reports are due at the beginning of winter quarter.

**Senior Spring:** During the spring quarter of your senior year, you will give an oral presentation of your work to faculty and students as part of the annual departmental “SIP Fest.”

**Evaluation**
At the end of the summer quarter your SIP advisor will evaluate your work to date to determine whether you have earned the summer unit of SIP credit.

When your project is completed, your SIP advisor will evaluate it. Advisors solicit a second opinion to confirm exceptionally high quality work deserving Honors and to confirm failing work.