# REU and Introduction to Research Projects

The Mathematics department at the University of Utah offers semester-long Independent Research Experience for Undergraduates (REU) Projects, as well as Introduction to Research Projects. This document explains what students can expect from REU and Introduction to Research Projects, and how to apply to participate in these programs.

**Individual REU Projects.** These REUs give individual students the opportunity to conduct research with the guidance of a mentor, a faculty member from the math department. Students typically seek out potential mentors to work with individually, though the director of undergraduate studies in the math department can assist students in their search. Mentors and students work together to decide on an appropriate project, to apply for the project to be approved, and to carry out the project during the course of a semester.

Projects last the duration of the semester for which they are approved. Each week, students are expected to devote about 10 hours to working on their projects. Near the conclusion of the semester (the precise date changes, but is made clear each semester) students who have participated in an REU are expected to submit a written report of their project and also to present their project at the REU symposium.

**Written report.** A written report should explain the project. Important topics that might be good to include in the written report are:

1. What had been the state of knowledge in the field before you began your project. (Context is always important in research.)

2. How your project added to the state of knowledge.

3. The methods of your research.

4. Possibly, what future research could be done, even if you don't intend to do future research on the subject yourself. (It's always nice to let others know where they could go next, and this is another important way to provide context for your work.)

The number of pages for written reports of REU projects varies vastly, depending on the number of figures, diagrams, coding excerpts, standard def-

initions, etc. that are included in the writeup. If you have questions about your individual report, the director of undergraduate studies in the math department would be happy to take a look at drafts and provide advice on an individual basis.

**Symposium presentation.** Each REU participant will present their work in an oral presentation of about 10 minutes in length. The presentation is usually an abbreviated form of the written report. It should have prepared slides, pdf's, powerpoint, etc., but otherwise the format is up to you. Handwritten (as long as it's easily readable), typed, or otherwise.

**Payment.** $1,500 usually in the form of a tuition waiver, in Fall and Spring semesters. $1,125 in Summer semesters.

**How to find a mentor and a project.** Students typically seek out mentors on their own. Any faculty member in the math department is eligible to be a mentor for an Individual REU Project. Students often speak with instructors they know, or find faculty with research in an area that interests them. Students and mentor discuss the sorts of projects that they'd be happy working on together, and develop a plan for how to conduct the research. A short description of this plan would be part of the REU application. Compared to some research programs, which are ongoing and have open seats to work on a fixed and pre-existing project, this process does put some extra burden on students initially, but it helps students and their mentors craft individual projects that are tailored for the individual backgrounds and goals of the students.

**Introduction to Research Project.** Most of the above descriptions were focussed on describing REU Projects. Introduction to Research projects are intended for students who would like more preparation before possibly undertaking an REU. Most of the REU descriptions above apply to Introduction to Research Projects, except that Introduction to Research Projects can be taken for course credit, don't require Symposium presentations, and pay $1,000 in Fall and Spring, $750 in Summer.

**Number of slots available and priority.** Typically, we expect to be able to fund 7 projects in Fall semesters, 6 in the Spring, and 4 in the Summer.

The quality of the project proposed is important. Other important factors include whether an applicant has had a previous REU opportunity, and

whether the applicant has had substantial preparation for an REU, including advanced coursework, pre-REU programs, or having taken MATH 4800.

**Application.** Applications should be sent to the director of undergraduate studies in math, ugrad_director@math.utah.edu

Application due dates are subject to change, but are often set for the last Tuesday before a semester begins. An application should contain a current unofficial transcript (a pdf generated on CIS). Also include a transcript from another institution if it shows advanced coursework in math. Applications should be accompanied by a letter of support from the mentor, sent in email to the director of undergraduate studies in math. Students should also prepare a description of the proposed project (less than a page is fine), and the following information should be provided, in itemized, numbered format to match the below:

1. Student/Applicant Name

2. uID#

3. U.S. Citizen, national, or permanent resident status

4. Are you applying for an REU or Intro to Research Project?

5. Will you be enrolled in courses at the University of Utah in the semester of the proposed project, or for summer projects, would you be enrolled in courses in the previous Spring and following Fall semesters?

6. Have you previously participated in an REU?

7. Have you previously participated in an Introduction to Research Project?

8. Have you taken MATH 4800? If so, who was the instructor?

9. Please list other preparation you've had for an REU, outside of coursework. Pre-REU programs, etc.

10. Have you, or will you, arrange for funding for this project through another source?

11. GPA in Math courses

12. List of university-level math courses you've completed