

# Interdisciplinary Science and Practice (ISAP)

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## Interdisciplinary Science and Practice (ISAP) Courses

### ISAP 1001 [0.5 credit]

#### Introduction to Interdisciplinary Science

What is interdisciplinarity and what are the challenges and opportunities of collaboration within and across disciplines in science and beyond? Topics include types of biases, public datasets and science communication.

Lectures and discussion three hours per week.

### ISAP 1002 [0.5 credit]

#### Seminar in Interdisciplinary Science

Exploring the role of interdisciplinarity in discovery and innovation, and discussion of selected issues facing society and the role of science. Topics include finding information, collaboration and science communication tools.

Prerequisite(s): ISAP 1001.

Seminar three hours per week.

### ISAP 2001 [0.5 credit]

#### Foundations in Critical Inquiry

What is science and the scientific method? Topics include the scientific method, credible sources of information, knowledge gaps, the impact of scientific discoveries, and discussion of their local and global implications.

Prerequisite(s): ISAP 1002 or permission of the Institute.

Lecture three hours per week, workshop two hours per week.

### ISAP 2002 [0.5 credit]

#### Research Principles for Interdisciplinary Science

Exploring how research is conducted. Topics include publicly available databases, the role of communication in research, stakeholders and participants, and the process of identifying knowledge gaps and developing research questions.

Prerequisite(s): ISAP 2001 or permission of the Institute.

Lecture three hours per week.

### ISAP 3001 [0.5 credit]

#### Principles and Applications in Data Analysis

Development of strategies for obtaining and analyzing data. Topics include: survey of publicly available science-data resources; identification of coincidental, correlational and causal relationships; statistical data-analysis techniques; concepts of risk and error propagation in measured and calculated values. Applications in the physical and biological sciences.

Prerequisite(s): ISAP 2002, COMP 1005 and STAT 2507 or permission of the Institute.

Lecture three hours per week, workshop two hours per week.

### ISAP 3002 [0.5 credit]

#### Applications in Interdisciplinary Research

Application of skills from Interdisciplinary Science and Practice (ISAP) courses to develop a research proposal. Topics include: research ethics; identification of stakeholders; inclusive consultation, collaboration and dissemination strategies.

Prerequisite(s): ISAP 2002 or permission of the Institute.

Lecture three hours per week, workshop two hours per week.

### ISAP 3003 [0.5 credit]

#### Science Communication

How is science perceived and how has science been communicated? Students will use case studies to assess examples of science communication with varying outcomes. Topics include the principles of effective science communication, the range of tools available, and knowing the audience.

Includes: Experiential Learning Activity

Prerequisite(s): ISAP 2002 or permission of the Institute.

Lecture and seminar three hours per week.

### ISAP 3004 [0.5 credit]

#### Science Policy

Exploration of how science-related policy is developed and the impact of policy on science. Topics include policy frameworks, stakeholder roles, power relationships, commercialization and the funding of science.

Prerequisite(s): ISAP 3003 or permission of the Institute.

Lecture and seminar three hours per week.

### ISAP 3700 [0.5 credit]

#### Topics in Interdisciplinary Science

Specific topics of current interest. Topics may vary from year to year.

Includes: Experiential Learning Activity

Prerequisite(s): Second year standing in the Interdisciplinary Science and Practice program or permission of the Institute.

Seminar/workshop three hours per week.

### ISAP 3999 [0.0 credit]

#### Co-operative Work Term

Includes: Experiential Learning Activity

### ISAP 4700 [0.5 credit]

#### Topics in Interdisciplinary Science

Specific topics of current interest. Topics may vary from year to year.

Includes: Experiential Learning Activity

Prerequisite(s): Third year standing in the Interdisciplinary Science and Practice program or permission of the Institute.

Seminar three hours per week.

**ISAP 4901 [0.5 credit]****Directed Studies**

Independent or group study, open to third- and fourth-year students to explore a particular topic, in consultation with a Faculty supervisor. May include directed reading, written assignments, tutorials, laboratory or field work.

Includes: Experiential Learning Activity

Prerequisite(s): third-year standing in the Interdisciplinary Science and Practice (ISAP) program and permission of the instructor.

**ISAP 4906 [1.0 credit]****Capstone Course - Group Research Project**

Students will collaborate on a project that addresses a real-world issue in a team environment. Focus includes: design and completion of a research project; development of communication, critical inquiry, data analysis and research skills; and the opportunity to develop initiative, creativity and self-reliance.

Includes: Experiential Learning Activity

Precludes additional credit for ISAP 4907, ISAP 4908.

Prerequisite(s): fourth-year standing in the Interdisciplinary Science and Practice (ISAP) Honours program and permission of the Institute.

Lecture, seminar and workshop four hours per week, as scheduled by the instructor.

**ISAP 4907 [1.0 credit]****Capstone Course - Research Essay**

A substantial, independent essay or research proposal-based critical review and research proposal, using library, database and/or bioinformatic resources, under the direct supervision of the instructor. Topics include identification and critical review of resources, development of writing skills and formulation of research question and strategy.

Includes: Experiential Learning Activity

Precludes additional credit for ISAP 4906, ISAP 4908.

Prerequisite(s): fourth-year standing in the Interdisciplinary Science and Practice (ISAP) Honours program or permission of the Institute.

Lecture, seminar and workshop four hours per week, as scheduled by the instructor.

**ISAP 4908 [1.0 credit]****Capstone Course - Individual Research Project**

An independent research project under the direct supervision of a faculty adviser. Evaluation is based on a written thesis and a poster presentation.

Includes: Experiential Learning Activity

Precludes additional credit for ISAP 4906, ISAP 4907.

Prerequisite(s): fourth-year standing in the Interdisciplinary Science and Practice (ISAP) Honours program, a major CGPA of 9.0 or higher, and permission of the Institute.

Lectures and discussion as scheduled by the course coordinator; other hours as arranged with the faculty advisor.

**ISAP 4999 [0.0 credit]****Science Communication Certificate Professional Development Workshop**

A one-day workshop providing practical skills development for becoming an effective science communicator. Topics for discussion will include defining the audience and framing of information, reviews of effective science communication, career opportunities for science communicators, and one-to-one analysis of participants writing skills. Graded SAT/UNS.

Includes: Experiential Learning Activity

Also listed as JOUR 4999.

Prerequisite(s): This course is restricted to students enrolled in the Certificate of Science Communication, and who have completed at least 2.0 credits towards the certificate, including one of COMS 2500 or ISAP 3003.

A one-day workshop