



# Undergraduate Research and Scholarship

## *High Impact Practice Leading to Campus-wide Student Success*

**University Honors College (UHC)** is UAA's central unit increasing the breadth, depth, quality, and number of undergraduate research and scholarly experiences. This high impact practice increases student success before and after graduation. The UHC provides access to excellence across all disciplines by offering 1) undergraduate research and scholarly learning opportunities, and 2) a multidisciplinary academic curriculum.



### UNDERGRADUATE RESEARCH PROGRAMS at UAA

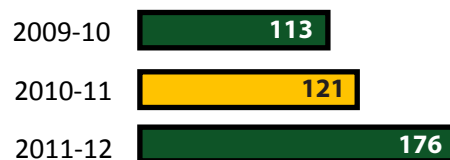
- **Robust UAA competitive grant program:** Awards for original research projects pairing undergraduate researchers with faculty mentors.
- **In the curriculum:** Undergraduate research, scholarship, and experiential learning.
- **Undergraduate Research and Discovery Symposium:** Students present research findings and receive campus-wide recognition.
- **Freshman Convocation** keynote speakers highlight undergraduate research: Nobel Laureates Sir Paul Nurse, Roger Tsien, Brian Schmidt and other world-class luminaries.
- **Task Force for Undergraduate Research & Scholarship:** Faculty leadership through campus-wide representation.
- **National Science Foundation-funded UAA-REU Program** in Biological Sciences, running continuously since 2007.
- **Faculty Leadership in Expanding Undergraduate Research (FLEUR)** Award for faculty to incorporate hands-on research experiences for students in undergraduate courses.
- **Faculty Development Program** for mentoring undergraduates in research and scholarship and annual recognition of outstanding faculty mentors with Exemplar Awards.

### UNDERGRADUATE RESEARCH IMPACT

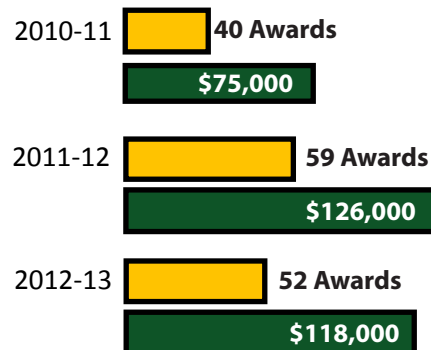
- **Publications** in national and international journals and conferences.
- **Acceptances** to top Masters and PhD programs and employment locally and nationally.
- **Major awards**, including the Fulbright, Goldwater, Marshall, and Truman scholarships. *The Chronicle of Higher Education* deemed UAA a top producer of Fulbright Scholars.

### SELECTED PERFORMANCE INDICATORS

#### Undergraduate authors or co-authors on peer-reviewed publications



#### UHC Awards and Total Amount Awarded



#### Undergraduate authors of oral or poster presentations at the Undergraduate Research & Discovery Symposium



Over 50 % of the UAA baccalaureate students graduate with an undergraduate research curricular experience.

UAA FLEUR Award model presented at the Council on Undergraduate Research Workshop, 13th International Society for the Scholarship of Teaching and Learning Conference, October 2013



## Undergraduate Research and Scholarly Activity

*Undergraduate research is a high impact practice that enhances student engagement, retention, completion, and success.*

*Don't just gain knowledge  
- create it!*

### URSA Activities

- **URSA Student Project Awards:** Funding for original research and creative scholarly projects pairing undergraduates with faculty mentors at all UAF campuses.
- **URSA Student Travel Awards:** Funding for travel by undergraduates to support or present their original research.
- **URSA Mentoring Awards:** Funding for mentors (faculty, postdocs, graduate students) to enhance or develop opportunities for undergraduate research, especially recurring opportunities.
- **Curriculum Support and Development:** Development of curricular opportunities for undergraduate research through creation of URSA courses and assistance developing departmental courses such as the Museum Research Apprenticeship Program (MRAP).
- **UAF Research Showcase:** A weekly seminar featuring current projects at UAF, making students aware of opportunities for research engagement and promoting active research across UAF and the greater Fairbanks community.
- **Fairbanks Research Day:** An annual celebration and presentation of research by undergraduate students at UAF.

### URSA Impact

- **Presentations** by undergraduates of their research at national and international meetings.
- **Publications** co-authored by undergraduates in peer-reviewed professional journals.
- **Acceptance** of UAF baccalaureate graduates to top graduate programs, professional schools, and employment locally and nationally.

### SELECTED PERFORMANCE INDICATORS

#### URSA Student Awards

	32 awards
AY2012	\$93,491
	45 awards
AY2013	\$107,967
	≈ 60 awards
AY2014 (projected)	\$147,831

#### URSA Mentoring Awards

	5 awards
AY2012	\$16,391
	8 awards
AY2013	\$31,938
	≈ 10 awards
AY2014 (projected)	\$35,203

URSA awards all derive from UAF's reinvestment of 1% ICR into student research

#### UAF undergraduates enrolled in 1 or more research courses

	FALL	SPRING	SUMMER	TOTAL
AY2012	137	210	15	362
AY2013	148	186	31	365



UAF is an AA/EQ employer and educational institution.

# URECA!

**Undergraduate Research - Experiential Learning - Creative Activity**



## OPPORTUNITIES

- URECA – Undergraduate Research & Creative Activity Awards
- Internships and Practica
- Directed Research
- Research Assistantships
- Experiential learning in catalog classes
- Research Experience for Undergraduates (REU)
- Juneau Icefield Research Program (JIRP)
- Capstone experience in most degrees

### Research

- Glacial outburst flood monitoring
- The glass cliff revisited
- Humpback whale identification
- Starry flounder metabolism
- Auke Creek fish weir
- Diagonalizable Linear Operators & Polynomial Zeroes

### Internships

- Legislative internship program
- Placements with Federal and State Agencies
- Lemon Creek Correctional Facility
- Alaska Native Language preservation
- Mendenhall Glacier Visitor Center

### Creative Activities

- Tidal Echoes
- Vegetable oil kiln
- Creating & publishing poetry
- Fine art techniques in comic books
- Cup library
- National Council on Education for the Ceramic Arts awards

### Experiential Learning

- Cuba semester
- Ecuador wintermester
- WhaleFest
- Bald Eagle Festival
- Beach seining, intertidal zone
- Ethnography
- Archeological digs



**UAS CORE THEME: RESEARCH & CREATIVE EXPRESSION**

*Provide programs and services that support research, scholarship, and creative expression by faculty and students.*

# **University of Alaska Strategic Direction Initiative Undergraduate Research Statewide Collaboration TURN (Teaching Undergraduate Research Now)**

## **Proposal: Development and Delivery of a Methods of Inquiry Course across all University of Alaska Major Academic Units**

### **Objective: Increase student retention, achievement, and attainment**

Undergraduate research is a high-impact practice for increasing student success (Kuh, 2008). We propose to create a 100-level introductory course that is taught at all three University of Alaska Major Academic Units (MAUs) with a common core of student learning outcomes centered around the principles involved in undergraduate research and scholarly/creative activity. The course will motivate students by presenting exciting research in multiple disciplines while preparing the students to conduct research in subsequent courses or co-curricular activities. These goals align with the Strategic Direction Initiative themes of student achievement, student attainment, and accountability.

### **Attributes and components of the course**

- Students need a reason to take the course. We will propose that the course satisfy a General Education Requirement through the curriculum committees at our respective MAUs.
- The course must present the methods behind research/creative activities in multiple disciplines. To accomplish this we propose to utilize a MOOC-like approach. We will generate a digital video library of approximately 12 TED-style videos, each 20-30 minutes in length, covering groundbreaking research and research methods in a diverse set of fields. The instructor at each MAU will choose a subset of these videos to incorporate into his or her course. Video presenters, selected from faculty members across the University of Alaska system, will receive compensation for their work.
- One hour-long forum session will be video recorded with a panel that consists of faculty researchers discussing how to address a key issue of importance for Alaska from the perspective of different disciplines. A moderator using a dynamic Socratic style of questioning will lead this TED-style panel. Sample topics include climate change, genetically modified food, or sustainability.
- The 12 TED-style videos and the TED-style panel can serve many functions. They will be suitable for individual broadcasts on Public Television. They can be compiled into a DVD series and used as teaching tools at institutions outside Alaska. They can be reedited to short promotional videos for use on the web or on television.

**Methods of Inquiry:**  
*How do we know what we know?*

**Course Content Guide**  
**University of Alaska**

I. **Revision Date:** June 16, 2013

II. **Course Information**

A. **College:**

B. **Course Subject/Number:** OURS/URSA/UNIV 121

C. **Credits:** 3

D. **Contact Hours:** (2 + 2) 30 contact lecture hours (2 contact lecture hours/week x 15 weeks = 30) plus 30 lab hours (2 contact lab hours/week x 15 weeks = 30) plus 60 hours outside work (4 hours outside lecture/week x 15 weeks = 60) plus 15 hours outside work (1 hour outside lab/week x 15 weeks = 15) for a total of 135 hours

E. **Course Title:** Methods of Inquiry

F. **Repeat Status:** No

G. **Grading Basis:** A-F

H. **Course Description:** How is knowledge acquired? This course introduces students to the ways that knowledge is both discovered and generated in multiple disciplines. The course covers the tools and study of the different means, materials, methods, nature, and ethics of academic inquiry. Online and face-to-face activities include lectures, presentations, faculty-guided discussions, active learning, and collaborative learning. The course includes skills and techniques in critical thinking, empirical and quantitative analysis, qualitative analysis, investigation, problem solving, learning, and research appropriate to the acquisition of knowledge in varying fields of study.

I. **Course Prerequisites:** (MATH A105 or concurrent enrollment) and (ENGL A111 or concurrent enrollment)

J. **Fees:** TBC; may be necessary for sustainability of the course depending upon the nature of the participatory research exercises and assignment

K. **Cross-listed:** No

III. **Course Level Justification**

This course is taught at the 100-level as a foundational gateway course to prepare students for courses and projects involving research/creative activity for the remainder of their degree program.

#### IV. **Instructional Goals and Student Learning Outcomes**

A. <b>Instructional Goals.</b> The instructor(s) will:
1. Guide student discovery of the generation and development of knowledge through various fields of inquiry.
2. Describe how questions are formulated and investigations conducted within various fields of inquiry.
3. Demonstrate the means, materials, and methods of inquiry in a variety of disciplines.

B. <b>Student Learning Outcomes.</b> Students will be able to:	<b>Assessment method</b>
1. Explain diverse fields of inquiry, including different ways of thinking used in critical and creative investigations across various disciplines and cultures.	Inquiry Project, Exam, Research Exercises/Assignments
2. Demonstrate and use general research and scholarly methods.	Inquiry Project, Exam, Research Exercises/Assignments
3. Identify, formulate, analyze, evaluate, and effectively communicate, in writing and orally, a problem, challenge, or issue.	Inquiry Project
4. Evaluate and utilize information resources in the context of research and creative scholarship.	Inquiry Project, Research Exercises/Assignments
5. Use both qualitative and quantitative research methods, including the knowledge, experiences, and values of communities and social groups, as the basis for academic inquiry.	Inquiry Project, Exam, Research Exercises/Assignments
6. Discuss ethical research conduct as a framework for the knowledge generated by academic inquiry.	CITI certification, Inquiry Project, Exam, Research Exercises/Assignments
7. Engage in collaborative learning with peers and faculty.	Inquiry Project, Research Exercises/Assignments

#### V. **Guidelines for Evaluation**

- A. Exams
- B. Inquiry project (includes oral presentation and written paper)
- C. Participatory research laboratory exercises/Assignments
- D. CITI certification

Suggested course grading breakdown:

Participatory research laboratory exercises/assignments <sup>1</sup>	25%
Midterm Exam	20%
Inquiry Project— Group Score	25%

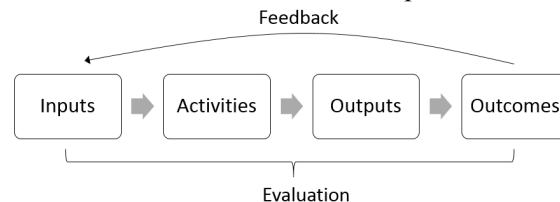
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<sup>1</sup> Assignments that incorporate active/experiential learning are recommended

Inquiry Project— Individual Score	25%
CITI certification	5%

## VI. **Topical Course Outline**

- A. Overview of inquiry, research methods, and scholarly/creative activity. The Logic Model as a contextual framework for a common process of inquiry.



- B. How to conduct a literature review.
1. Orientation to library and information resources.
  2. The student should be able to distinguish and evaluate between different types of sources: peer-reviewed journal article, edited book, academic vs. popular book, different types of research reports, archival, online sources, etc.
  3. Overview of bibliographic software and its use.
  4. Overview of citation and bibliographic styles.
- C. Expose students to a broad range of fields of inquiry and the various means, materials, and methods that are used to generate knowledge. Each week will focus on a particular field of inquiry. All academic disciplines are candidates for discussion. The instructor will select presenters to cover a diversity of disciplines.
1. Presentations (live or via recorded video from a library of presenters) from UAA, UAF, or UAS faculty and /or other national researchers that enable students to gain insights into the investigative study and research conducted in various disciplines. Subsequent corollary discussions in the class will provide the vehicle for further exploration of the lecture topic. The presentations will introduce students to applicable research tools, materials, and methods.
  2. Assigned readings complementary to that week's presentation. Narratives of inquiry using various methods in the different disciplines and fields of study will be presented.
  3. Faculty are encouraged to incorporate interdisciplinary and multi-disciplinary processes and approaches.
  4. Participatory research laboratory exercise tied to that week's topic will be completed by teams of students.
  5. The presentations and subsequent discussions and activities will reinforce how research design and scholarly methods/creative activities are conducted in the field of inquiry.
- D. Ethical considerations in conducting research.
1. CITI Certification.
  2. Use of animals in research.
  3. Plagiarism and data falsification.

4. Authorship.
- E. Students will conduct their own group inquiry projects. Each group will be expected to complete a written inquiry paper that addresses one academic question from different perspectives—e.g., natural sciences, social sciences, business, art, etc.
1. The paper should provide: a description of the methodology used to look for answers/solutions, including the processes used to gather information; the justification for a solution or answer; and a discussion of the analysis and synthesis of the results, including a discussion of the merits of the results, the credibility, usefulness, and significance of the outcome of the inquiry, particularly in regard to the community at large and specific social groups. Students are encouraged to use print, websites, places, people, papers, objects and artifacts, still images, and video as sources. Particular attention should be paid to the information resources that specific communities and social groups may provide. Final papers may include videos, images, and performances.
  2. How to write a project proposal.
  3. How to give a project presentation.
  4. Each group will present their results to the class and develop a poster for presentation at a university symposium.

## **VII. Suggested Text**

Firestein. 2012. *Ignorance: How It Drives Science*. Oxford University Press.

## **VIII. Bibliography**

Booth, Columb, Williams. 2008. *The Craft of Research*. University of Chicago Press.  
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Locke. 2009. *Reading and Understanding Research*. Sage.  
Robson. 2007. *How To Do A Research Project: A Guide for Undergraduate Students*. Blackwell.  
Salkind. 2011. *100 Questions (and Answers) About Research Methods*. Sage.  
Walliman. 2010. *Research Methods: The Basics*. Routledge.