The Biology, Society & Environment
Senior Project
Fall 2015

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http://www.geog.umn.edu/ugrad/
Lots of Info on BSE website:
http://www.geog.umn.edu/ugrad/bse.php
Quick Link to Senior Project at top right

• Steps to the BSE SP
  – Visual schema of options w/ timeline
• Pathways to the BSE Senior project
  – Selecting a topic & SP supervisor
  – Links to Databases, planning tools, & step by step guide
• Information Sheets
  – Directed Study Info for Students & SP Supervisors
  – 2xcr Information Sheet
• Registration & Approval Forms
What can I do for my senior project?

• Work with faculty or instructors in ANY UMTC college of school
  – College of Liberal Arts
  – CBS, CFANS, CEHD, ....
  – Med School, Pharmacy School, Dental School, etc.
  – Institute on the Environment
  – School of Public Health
  – The Population Center
  – Many, many more!

• BSE majors have options than any other UMTC major!
• Create something really cool!
• Just get it done if that is your goal...
What can I achieve?

Tailor your senior project experience to your interests and goals!!!
Connect academics with the “real world”...

Do you:

• need scientific research experience?
  – Find a lab to work in and gain valuable research skills…

• value community-relevant work?
  – Find a mentor who will help you design a socially engaged research project...

• need a great letter of recommendation for grad school or a job?
  – Work with a leading professor in your field...

• plan to apply to Graduate School?
  – Develop a writing sample that will get you there…
Who will I work with?

• Instructor of a course I take at UMTC
• Instructor of a senior project seminar
• Faculty at UMTC
  – Teaching appointment
  – Research-only appointment
• Other possibilities
  – UMTC Staff with advanced degrees (MA, PhD, JD...)
  – Graduate Student or Post-doc supervised by UMTC Faculty
  – Faculty at UMTC AND non-UMTC professional in area of interest (Student must find a workable duo!)
When do I start?

- Recommend completion of SP one semester PRIOR to Graduation

- Start creating a timeline TODAY!
  - Timeline will vary depending on
    - What you will do (original research?)
    - Who you work with
    - What you want to produce or achieve
BSE SP Options

1. Do Research with a Faculty Mentor
   – Lab Research
   – Field Research
   – Social Sciences or Humanities

2. Complete a 2 extra-credit project w/ one of your BSE major courses

3. Take a Senior Project Seminar
   – HMED 4960: Research in the History of Medicine
   – URBS 3955W: Research Projects in Urban Studies
Planning the project:
Start now and narrow as you go!

- Create an Initial Timeline (See Guide)
- Identify a general topical area &/or discipline and consider what you want to “produce”:
  - natural sciences, social sciences, humanities, interdisciplinary
  - what will I do and from what disciplinary perspective?
- Consider what you want to achieve
- Identify a Senior Project Supervisor or course
- Refine Topic/Project w/ Supervisor
- Register: know when and how
WHAT will I do???

**Conduct original research:**
- May require a 2 semester commitment
- Kinds of research
  - Lab research
  - Field research/ethnographic study
  - Survey research
  - Archival research

**Review secondary sources to analyze:**
- Disciplinary Fields
- Professions
- Policies
- Ethical Issues
- Scientific or Social Events
- Knowledge Production / “Discoveries”
Approaches: Kinds of research

• Lab:
  – Oncogenes, quorum sensing, dendro, climate analysis
  – Labs may be in located in CBS, CLA, Med School, etc.)

• Field research
  – Environmental Topics: agriculture, education, tracking pops
  – Human Communities: ethnographic study
  – Many disciplines: Marine Biology, Anthro, Geography

• Survey:
  – Research on individual behaviors or community practices
  – Many disciplines: Sociology, Nutrition, etc.

• Archival Research: primary source
  – History of Science, Sociology,
Approaches:
Analysis of Secondary Sources

• Write about the history of your future profession
• Write about a scientific discovery or social issue
• Analyze environmental or medical policy
• Analyze ethical issues related to medicine, science, environment
What Will I produce?
The Product

Typical Outcomes
- Research paper (thesis),
- Lab Report
- Poster &/or public presentation of work

Other Possible Outcomes
- Set of Brochures
- annotated bibliography
- grant or fellowship proposal
- digital map, database, or website
- artistic work

Minimum for a 3 credit (lab or field) research project:
- 6-12 hours research per week plus a 2-3 page summary of your research experience.
Who can supervise my senior project?

BSE Senior Project supervisors hold appointments in many UofM colleges, schools and institutes:

- CLA, CBS, CFANS...
- Medical School
- School of Public Health, Center for Bioethics....

**Your SP Supervisor MUST work at the UofM and be Qualified to grade student work!**
Health-related Senior Projects

- The Rise of Autism in East African Communities - Environmental Influence vs. Genetics (School of Public Health)
- The Introduction of Folic Acid into Prenatal Care (Med School)
- Literature review of brain genes important in psychotic disorders (CBS-Neurosci)
- Nurse Anesthetist Supervision Controversy (School of Nursing)
Environmental Senior Projects

- The Impact of Oil on Navarian Citizens (CFANS)
- Climate Change in Williamsburg Region: Water Change and its Effects on Human Health (Dept. of GES)
- Climate Change, Ecosystem Services and Human Valuation (School of Public Health)
Other Scientific Research

• Dissecting the role of Hif1_a in the pancreatic ductal adenocarcinom (CBS-GCD)
• The Effect of Metformin on Cancer Cells (School of Pharmacy)
• Role of chromatin and/or DNA damage response genes in X-inactivation and cancer (Med School)
• Estimating Tiger Population Size in Parsa Wildlife Reserve in the Lowlands of Nepal (CFANS- ESPM Study Abroad)
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How to identify a SP supervisor

• See Pathways document and also:
• CBS Roadmap to Research
• Experts at UMTC
CBS Roadmap to Research:

http://cbs.umn.edu/info/undergraduate/undergraduate-research/roadmap

Roadmap to research

The goal of this roadmap is to get you started in undergraduate research, but we have also included links to other opportunities.

These steps are intended as a preliminary source of information and guidance towards research. It is not a substitute for meeting and talking with faculty to discuss what interests and engages you the most.

Best wishes as you map your plan!

Step one: Identify approach
Step two: Identify interests
Step three: Research
Step four: Make contact
Step five: Create a plan
Step six: Success
http://experts.umn.edu/

- Database of all research/researchers at UMTC
  - Broaden or Narrow your search
- Have a topic? An idea? A question?
- Experts Database gives results & links to:
  - Many disciplines studying a single subject
  - Many researchers in that area
  - Database of their papers
- Look up a lab or personal site using onestop
  - See who they are
  - New projects
  - Possible openings (lab, field project, transcription job, etc.)
Experts

Rachel L Widome
Epidemiology

Jean Forster
Epidemiology

William G Weber
Research and Outreach Centers (CDES)
Architecture

More (32)

Research outputs

Interventions to Reduce Tobacco-Related Health Disparities
Contribution to journal » Article

Public education about the relative harm of tobacco products: An intervention for tobacco control professionals
Contribution to journal » Article

Activating lay health influencers to promote tobacco cessation
Contribution to journal » Article

More (907)

Research units

Environmental Health Sciences
Public Health, School of
Department
William G Weber
Senior Research Fellow, Research and Outreach Centers (CDes)
Lecturer, Architecture
Phone: 612/625-0595 • Email: wmwber@umn.edu

Summary
Research outputs (2006 - present) 4
Co-author Network 8
Institutional Network 3

Fingerprint
- Public Housing
- Condition monitoring
- Energy resources
- Health
- Project management
- Monitoring
- Mental Health
- Museums
- Costs
- Energy conservation

Full Fingerprint • Experts with a similar Fingerprint

Research outputs
- Self-reported health outcomes associated with green-renovated public housing among primarily elderly residents
  Research output: Contribution to journal • Article
- Health outcomes and green renovation of affordable housing
  Research output: Contribution to journal • Article
- Solar architecture in Minnesota: Toward zero energy housing
  Research output: Chapter in Book/Report/Conference proceeding • Conference contribution
- Solar architecture in MINNESOTA: Toward zero energy housing
  Research output: Chapter in Book/Report/Conference proceeding • Conference contribution

Journals
- Public Health Reports
  ISSN: 0033-3549, 0033-3539
  Additional searchable ISSN (Electronic): 0033-3549
- Journal of Public Health Management and Practice
  ISSN: 1078-4659

View all »

Projects
- Franklin-Portland Gateway Phase IV - Technical Assistance and Research Support
  Project: Research project
- Minnesota Sustainable Housing Initiative Knowledge Base Outcomes and Outreach
  Project: Research project
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Complete a 2 extra-credit project w/ one of your BSE major courses

• See 2xcr Info Sheet (on BSE website)
• Make sure the course is eligible for a 2 xcr add-on project (CLA departments ONLY)
  – See list on 2xcr Info Sheet & SPA form
  – Old Curric: Many BSE core & theme electives are eligible
  – If the discipline (course designator) isn’t listed, the department or school is likely outside of CLA
  – Coordinate your research with a course, but MUST do 3 credits worth of additional work

• Environmental Geography Courses- this is the only option for 2xcr projects with a “science” course
  – Every Spring: Geog 3401 : Environmental Systems
  – Some Semesters: Dendrochronology, Urban Climatology, Earth’s Climate
Timeline for 2xr Projects

• Contact SP supervisor **ASAP**
  – Prior to registering for the “parent” course (your core/theme or Sci&Soc Req/Elect)
    • Why? To get an early start / review syllabus for class
    • Why? Popular faculty may only be able to work with 2-5 students, so their “capacity” to supervise SPs “fills up” fast!
  – Must be registered in “parent” course (by first UMTC add deadline (2nd week of classes)
  – Register for SP course (directed study) by deadline (CLA = 5th week)
  – Have a back-up plan in case an instructor can’t or won’t supervise a SP experience with their course
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HMED 4960: Research in the History of Medicine

• Offered Fall & Spring
  – BSE can’t guarantee it will be offered, but historically has been offered every fall/spring semester for past 4 years
  – Registration: Contact instructor PRIOR to opening of registration (only 20 seats! Reserve a seat by acting early)

• Instructor (SP Supervisor)
  – Dr. Peter Kernahan (Fall 2015)
    • Assistant Professor and Lecturer
      – Integrative Biology & Physiology
      – History of Medicine
  – Mary Thomas (Spring 2016)
    • Lecturer
      – History of Science & Technology
Senior Projects

(HMED SP Seminar; 3cr)

• A Cultural History of Penicillin
• HIV/AIDS and Dental Ethics in the 1980s
• Cholera: The preventable illness that changed Public Health
• Health, Healing & Water in Yellowstone
• History of Total Ankle Replacement
• The Blame Game with Autism
• Prosthetics during the Civil War
Lots of Info on BSE website:
http://www.geog.umn.edu/ugrad/bse.php
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  – 2xcr Information Sheet

• **Registration & Approval Forms**
  – SFC & SPA
Senior Project Approval Form (SPA) and Registration Deadlines

• SPA form Deadline:
  – 5th week of classes
  – Earlier, if possible
• Registration Deadlines:
  – CBS (and SPH) by Add deadline (Directed Research Contract)
  – CLA by 5th week of classes (Student-Faculty Contract)
  – Different colleges & programs have different deadlines for registration! – contact Student Services, College Advisor, or
• Must be signed by SP Supervisor & Student
• Attach a full project abstract or a directed study contract to SPA
  – Contracts required for CLA and CBS registration
More about research options

• Upcoming events
• UROP: Undergraduate Research Opportunities Program
  – http://www.urop.umn.edu/
• CBS Roadmap to Research:
  – http://cbs.umn.edu/info/undergraduate/undergraduate-research/roadmap
GES Health Career
Brown Bag Panel Discussion

Once Each semester
• BSE Alumni who are presently enrolled in:
  – MD, DDS, Pharm-D, Physical therapy and other programs in the Twin Cities.
  – Discussion and Q&A
  – Networking with former BSE students who have successfully achieved their goal of admission to their 1st choice professional program
Every Fall

• Panel of Grad students attending UMTC
  – School of Public Health
  – Geography, MGIS,
  – Humphrey School

• A great opportunity for students who are considering applying to Graduate Schools, to talk to Graduate students who are currently enrolled at UMTC about their experience applying to and being accepted to their graduate programs.
Bridge to Research Experiences for Undergraduates
– minority student focused

• The **North Star STEM Alliance** supports **minority students** interested in research.
  – Ongoing Thursday Research series for minority students
    • The Bridge to Research Experiences for Undergraduates series meets each Thursday.
    • A more in-depth background and preparation series each Thursday.
  – More info: [http://www.northstarstem.org](http://www.northstarstem.org)
• **Bridge to Research Experiences for Undergraduates**
  – What research is about and how to arrange it.
  – Registration via STEM Alliance
November

- This is your opportunity to find your perfect research position!
- Get information about how you can get involved in research from groups such as MAYO, UROP, Lillehei Heart Institute, the Minnesota Craniofacial Research Training Program, CLA Career Services, and many more! Coffman Memorial Union; Mississippi Room (3rd floor)
  - Sponsored by the CLA Student Board
  - Free event for all CLA students.
UROPs

• Collaborate w/ faculty
  – On their research
  – On your own research

• Learn how to write a grant proposal

• Really great for resume/c.v. building!
  – It is NSF funded & competitive...which means it carries prestige

• Has been changed to a “scholarship”
  – No longer paid in cash 😞
UROP | Undergraduate Research Opportunities Program

Why Research?
Research at the University of Minnesota provides undergraduate students the opportunity for faculty mentorship, active learning, and a chance to create new knowledge while being challenged in new ways.

Our curiosity makes us who we are. It is why we are driven to discover.

What is UROP?
The University of Minnesota’s Undergraduate Research Opportunities Program (UROP) awards scholarships to undergraduate students who work on a research project with a faculty mentor.

From studying gender identities in Hmong culture to how biofuel industries affect ecosystems the breath of research topics is endless!

Learn More
Join the U of M community and contribute to our world class research endeavors.

Visit urop.umn.edu for more information or watch the video at z.umn.edu/whyresearch.

Plan your Career
Get experience in a field that will sharpen your career planning.

Grad School Prep
Strengthen your application to Graduate or Professional School.

Get a Scholarship
Students participating in UROP receive a $1,400 scholarship.

Opportunity to Travel
Want to travel abroad? UROP now offers international funding for adventurous researchers!

Expand Your Network
Meet other students and faculty who share your passion to discover and express yourself through research.

Challenge Yourself
Set high goals and contribute to collective global knowledge and culture of the world.

The University of Minnesota is an equal opportunity educator and employer.
Get Started
Follow these 6 easy steps to apply today!

Discover your interest
- Struck by something you heard in class?
- Heard something interesting on the news?
- Read something that stirs your imagination?

Find a faculty mentor
- talk to your academic adviser, professor, or TA
- ask the Director of Undergraduate Studies
  in a department of interest
- browse department websites for faculty profiles
- contact the UROP Office

Design a project
Use your mentor for help with your research project.

Visit urop.umn.edu
Fill out the application in the forms library.

Write a proposal
Remember, you need permission to use human or animal subjects.

Questions?
If you have questions, ask! The UROP staff is here to help you with each step of the process.

511 Bruininks Hall | 612-625-3853 | urop@umn.edu | www.urop.umn.edu
UROP Projects

• Annual Tree Ring Growth and Crossdating in Abies guatemalensis in Guatemala Geography CLA
• Spatial Analysis of Chongqing Municipality within and the Greater PRC Geography CLA
• Oil, Law, and Territory on the Ft. Berthold Reservation, North Dakota Geography CLA
• The Sound of Our Warming Planet: Expressing Global Temperature Change as a Series of Musical Notes Geography CLA
UROP Projects

• Early Detection of EBV Antibodies during Infectious Mononucleosis by Line Immunoassay Laboratory Medicine & Pathology AHC
• Disruption of Type I Insulin-Like Growth Factor Receptor Interaction with Insulin Receptor Substrate Using Inducible shRNA Knockdown Cancer Center AHC
• Hif1 BiolSocEnv Liberal Arts Anindya Bagchi Cancer Center AHC
• Functional Properties of Myosin Essential Light Chain Mutations that Cause Heart Disease Biochemistry-Med School AHC
• Reversal of Hypothyroidism in International Adoptees Pediatrics AHC
• Perspectives on Health Equity Family Medicine & Community Health AHC
• The History of Distilling and Fermentation Medicine AHC F14 Neural Mechanisms of Drug Abuse in Females Neuroscience CBS/AHC
UROP Projects

Title. Discipline/Dept. Other Colleges & Schools

- Green Implications of Nanoparticle Device Synthesis
  Chemistry CSE
- Examining the Relationship Between Bioenergy Production
  and Plant Invasions: Competitive Effects of Switchgrass
  Biofuel Cultivars Agronomy & Plant Genetics CFANS
- In-lake sampling of Milfoil weevils. Fisheries & Wildlife CFANS
- Language uses and needs in Outdoor Recreation Forest
  Resources CFANS
- Effects of Intergenerational Caregiving on Cognitive Function
  and Physical Health of Grandparents Nursing Nursing
UROP vs. Senior Project

• Students may NOT do UROP and Senior Project in the same semester!!!

• UROP may lead to a Senior Project

• Senior Project may lead to a UROP

• Other Competitive programs:
  – McNair Summer Scholars program
  – MSROP
  – School of Public Health Summer Institute
Declare NOW!

- BSE Declaration Clinics are the fastest way to declare/re-declare
Break-out Groups & Brain-storming

5 mins

• Have I already written something I'm proud of that I could expand into a senior project w/ more research and reading?

• Is there a topic I've always wanted to write about?

• I'm working in a lab or I've applied for a lab position or I want to apply for a lab position

• I'm new to this and I want to learn more...