

CLS 4801 Fall '08
Research Projects in Clinical Laboratory Sciences
Syllabus

Research Project: Each team must plan, design, secure research funding, conduct, report, and present an original applied research project. The project may be conducted in any CLS discipline, but it must be original research. For examples of previous year's CLS projects go to <http://www.weber.edu/DCHPResearch/researchprojects.html> (this link is also be posted on the course Blackboard site). A project research log (notebook) will be used to record all pertinent information.

The research project will consist of the following components:

- a. **Literature search.** Once you have selected your research topic, you will need to do a thorough literature search. There are a number of database search engines available through the WSU Library such as PubMed and Medline. (Don't you dare use Google, although try a new search engine called Google Scholar) Links will be posted in Blackboard at the course web site. Your literature search must include at least 4 to 5 relevant journal articles. You will submit (as a Blackboard assignment) a listing of the articles (the specific format will be discussed) followed by a paragraph on each one describing its relation to your project. **(20 points)**
- b. **Project description.** This assignment will consist of a one to two page report describing the experimental design of your project. The report will consist of three sections: an abstract (one paragraph summary of the project), an introduction (three or four paragraphs explaining in detail why the project is relevant and what you hope to accomplish), a material and methods section (a list of supplies that you will need, followed by a detailed procedure), followed by the literature citations. **(50 points)**
- c. **IRB tutorial and application.** All research projects conducted on campus that involve human subjects must be pre approved by the WSU Institutional Review Board (IRB). Once you have designed your project, if it is determined that IRB approval is needed, your team will need to complete an IRB application form at <http://weber.edu/IRB>. Before you can submit your application, WSU policy requires that anyone applying for IRB approval must have completed an online tutorial (a link can be found at <http://weber.edu/IRB> , click on Training in the purple bar, then select the link that takes you to the National Cancer Institute web site - **not** the NIH web site which is training for IRB board members). At the end of the tutorial, you will have the option to print a certificate of completion. It is very important that you print three copies (you save two, and the other goes in Scott's departmental mail box). **(10 points)**

For the purpose of the class, all students will complete the tutorial, even if an IRB application is not needed. The printed certificates from your team,

along with your faculty mentor's certificate, must be included when your application is submitted. Your faculty mentor will need to be the one to submit the final application to the IRB. This needs to be submitted no later than the last week in September.

- d. **Grant proposals.** All teams will complete and submit a university grant application to cover the cost of the project supplies and equipment. The grant applications are submitted to the WSU Office of Undergraduate Research (OUR) by Sept 29, 2007 for the first round, and Nov. 3 for the second round, and will be evaluated on a competitive basis with other university undergraduate research proposals. Each team member is responsible for reviewing OUR grant and fellowship guidelines and information at <http://www.weber.edu/OUR/getinvolved/grants.html> (there is a link in Blackboard). If there is a significant cost for the supplies for the project, outside funding must be obtained. **(50 points)**
- e. **Data collection.** As soon as funding is available, supplies and equipment must be ordered so that research can begin sometime in November, earlier if sooner. It is expected that work on most projects will continue into Spring Semester. **(100 points)**
- f. **Project supply spreadsheet.** Each team is required to maintain an Excel spreadsheet as a means of tracking the costs of all supplies and equipment purchased over the course of the research project. First draft is to be submitted (as Blackboard assignment) the last week of the semester. **(25 points)**

(Total points for research project Fall Semester = 255 points)

The following portions of the research project will be completed Spring Semester:

- g. **Final manuscript.** Upon completion of your project, each team will write up the results in manuscript form (Journal of Clinical Laboratory Sciences or Laboratory Medicine format). **(50 points)**
- h. **Final project supply Excel spreadsheet (25 points)**
- i. **Project presentations.** Each team will present their project (as a PowerPoint oral presentation or poster format) at two conferences: WSU Undergraduate Symposium (oral presentation) and ASCLS Spring Seminar (both oral and poster format). In addition, teams are strongly encouraged to apply to present (poster format) at NCUR (National Conference for Undergraduate Research). Funding to attend the national conference must be attained through the WSU Undergraduate Office (OUR), and is awarded on a competitive basis. **(50 points)**

- j. **Project manuscript for publication(s).** Each team will submit a manuscript to ERGO, the WSU Undergraduate Research Journal by the end of April. If your project is of high enough caliber (i.e. is it worthy!), we strongly recommend that it be submitted for publication in a refereed scientific journal.

(Total points for Spring Semester = 125 points)

Semester Schedule

Week 1 (August 25)

Select teams (Blackboard email to Scott by Wed. Aug 27).
Start research project discussions, select possible research topic, discuss with faculty.

Week 2 (September 1)

(Labor Day is Monday, September 1, no class meeting this week)
Since there is no class meeting this week, watch for announcements/emails in Blackboard.
IRB tutorial to be completed by Sept 5 (including printed certificates in Scott's mailbox).

FAST TRACK

Research topic ideas and a brief 2-3 paragraph description due Sept 5.
(Blackboard attachment, see Assignments - Project Description Brief)

Week 3 (September 8)

In-class discussion of individual team's research topics for those that have finalized project concepts (5-10 min presentation from each team).
Research literature search due Sept 12 (Blackboard attachment, see Assignments).

Week 4 (September 15)

Research project description, full report, including supplies and cost estimates, due Sept 17. (Blackboard attachment, see Assignments - Project Description Full Report).
Review OUR grant and fellowship guidelines and suggestions (link to site in Blackboard).
Review CLS DCHP undergrad research project examples from past years (link to site in Blackboard).
Prepare WSU undergrad research grant proposal (link to site in Blackboard) to be reviewed by CLS mentor and faculty, due Sept 19 (Blackboard attachment).

Week 5 (September 22)

Submit final grant proposal to DCHP undergrad research committee for review, due Tuesday, Sept 23 (Blackboard attachment).
IRB research application due Thursday, Sept 26 (Blackboard attachment). Faculty mentor will submit the final application to IRB as an email attachment.
Students will turn in hard copy with signed signatures to IRB chairperson either by campus mail or hand deliver).

Week 6 (September 29)

Final submission of WSU undergrad grant proposal to OUR due Sept 29 (13 hard copies delivered to OUR, along with Blackboard attachment).

Week 8 (October 13)

Order supplies for research project (See Kent). Develop Excel supply database to track supply costs.

Begin initial experiments on research project as soon as possible and continue through rest of semester.

Provide weekly updates on progress of experiments to faculty mentor.

Week 15 (December 1)

Submit Excel supply database. Due Friday.

SLOW TRACK

Research topic ideas and a brief 2-3 paragraph description due Sept 29.

(Blackboard attachment, see Assignments - Project Description Brief)

Week 6 (September 29)

In-class discussion of individual team's research topics for those that have finalized project concepts (5-10 min presentation from each team). Continue next week if needed.

Research literature search due Oct 3 (Blackboard attachment, see Assignments).

Week 8 (October 13)

Research project description, full report, including supplies and cost estimates, due Oct 16. (Blackboard attachment, see Assignments - Project Description Full Report).

Review OUR grant and fellowship guidelines and suggestions (link to site in Blackboard).

Review CLS DCHP undergrad research project examples from past years (link to site in Blackboard).

Week 9 (September 22)

Prepare WSU undergrad research grant proposal (link to site in Blackboard) to be reviewed by CLS mentor and faculty, due Sept 22 (Blackboard attachment).

IRB research application due Sept 24 (Blackboard attachment). Faculty mentor will submit the final application to IRB as an email attachment. Students will turn in hard copy with signed signatures to IRB chairperson either by campus mail or hand deliver).

Week 10 (October 27)

Submit final grant proposal to DCHP undergrad research committee for review, due Tuesday, Oct 28 (Blackboard attachment).

Week 11 (November 3)

Final submission of WSU undergrad grant proposal to OUR due Nov 3 (13 hard copies delivered to OUR, along with Blackboard attachment).

Order supplies for research project. (See Kent). Develop Excel supply database to track supply costs.

Begin initial experiments on research project as soon as possible and continue through rest of semester.

Provide weekly updates on progress of experiments to faculty mentor.

Week 15 (December 1)

Submit Excel supply database. Due Friday.

**CLS 4801 Fall '08
Important Dates**

Funding:

DCHP UR Committee grant review

First Round - September 15, 2008

Second Round - October 27, 2008

OUR grant due dates for "In-Depth/Long Term Grant"

First Round - September 22, 2008

Second Round - November 3, 2008

<http://weber.edu/OUR/default.html> then click on the "Student Grants" link

In-depth/Long-term Grants support substantial, in-depth projects that normally span several semesters. Priority is given to projects that culminate in an honors thesis or some other capstone product demonstrating a focused and intellectually rigorous perspective on the topic of interest. Proposals are reviewed by the Grant Review Sub-committee twice per semester. There is a \$3500 budget limit.

Conferences:

UCUR (Utah Conference for Undergraduate Research)

Application date: Nov. 2008

Feb 19-20

Westminster College

Salt Lake City, UT

<http://www.ucur.org/>

WSU Undergraduate Research Symposium

Abstracts accepted Jan 5-Feb 9, 2009

Mar 2-3

WSU Ballrooms

<http://weber.edu/OUR/default.html> then click on the "Symposium and Celebration" link

Required - oral presentation (PowerPoint format, 15 min)

ASCLS-UTAH / CLMA-UTAH Spring Seminar

End of March or early April,

Salt Palace, Salt Lake City, UT

<http://www.ascls-utah.org/>

Required - poster presentation (in ASCLS National Conference Format)

NCUR 2009

Application and abstract to OUR for travel grant Oct 27
Application abstract due to NCUR Dec 1
Notification of acceptance by NCUR Jan 23
April 16-18th, 2009

University of Wisconsin - La Crosse
La Crosse, Wisconsin
<http://www.uwlax.edu/ncur2009>

CLS faculty will select which project(s) would be appropriate to present at this national conference. Poster presentation (NCUR format). Travel funds maybe available through OUR, DCHP, and the CLS Department.

ASCLS National Convention

July 21-25
Chicago, IL
<http://www.ascls.org/conferences/index.asp>

CLS faculty will select which project(s) would be appropriate to present at this national conference. Poster presentation (ASCLS format) and student poster competition. Travel funds maybe available through OUR and the CLS Department.

Publications:

ERGO (WSU UR Journal)

<http://weber.edu/OUR/default.html> then click on the "ERGO" link

Required - final manuscript submission - (ERGO format). You will submit the manuscript to Blackboard (not ERGO). ERGO will not accept submissions until the following fall semester for publication the following spring semester. If you are graduating, the CLS faculty will submit the manuscript for you in the fall.

Clinical Laboratory Science Journal

<http://www.ascls.org/leadership/cls/index.asp>

You can consider this journal or another scientific journal 1) if your project has regional and/or national applications and 2) if your research results add something new to the existing body of knowledge.

CLS 4802 Spring '09
Research Projects in Clinical Laboratory Sciences
Syllabus

Blackboard research project assignments:

- a. **Project time line.** Early in the first week of the semester, make an appointment with your project mentor to review the status of your research project. This meeting must include each person in your group. Out of this meeting, you will develop a detailed weekly project time line involving experiments and or project milestones through Week 8 or 9 (research to be completed by then). The format can be a bullet point list (Word or Excel) or paragraph list (Word), broken out by each week. You will be required to keep this time line up-to-date throughout the semester.
Due Wednesday Jan 14, Week 2 and reviewed periodically (50 points)

- b. **Project description update.** Each of the current research project descriptions are posted on the college UR web page at <http://www.weber.edu/DCHPResearch/researchprojects.html> (this link is also be posted on the course Blackboard site). Each individual in each group will be responsible for reviewing the information posted for their specific project. There may be additional information to add at this point. If any changes or updates need to be made, submissions will be made in Blackboard. If no updates need to be made, so submission is necessary. There are no points for this assignment.
Due Wednesday Jan 14, Week 2.

- c. **Supply list.** Each project group is required to keep an up-to-date comprehensive supply list as an Excel spreadsheet. Include the following: supply items, date ordered and received, supplier, who placed the order (for example Kent, or IHC central lab, Davis hospital lab, etc), along with shipping and tax when available (For those supplies ordered through Kent, he can provide this information to you about a month after receiving an item). The 1st record of the spread sheet must include the group number, student names and date of last update. The spreadsheet must be kept current throughout the semester. When submitting this assignment, be sure to use the appropriate file name including your initials.

For those projects that have absolutely no cost to complete, a submission for this assignment will only require a short comment in the submission box of the assignment, stating that there are not costs.

Due Wednesday Jan 14, Week 2. (20 points) and also final supply list due at the end of the semester in Week 15 (50 points)

- d. **Data collection notebook.** A notebook (of your choice and format) will be kept to record all experiments. Details of what should be included will be discussed in class. Also, ask you mentor for suggestions.

Due Friday March 20, Week 10 (100 points) Notebooks will be returned after quick review.

Research experiments must be completed by Week 8, February 27, or Week 9 March 6 at the latest.

- e. **First draft CLS Journal manuscript.** Upon completion of your project, each team will write up the results in manuscript form. The format will be that used by the Journal of Clinical Laboratory Sciences format, which is CBE scientific style.
Due March 6, Week 9 (75 points)

Spring break March 9 to 13

- f. **WSU UR Symposium oral presentation**
Mentor must review PowerPoint presentation slides by March 20
No Blackboard submission necessary
Conference March 23, Week 11 (100 points)
- g. **Peer eval of first draft of CLS Journal manuscript.** Each student will proof read two other papers written by other groups. Proofing will be done in Word and posted in Blackboard for the authors to retrieve.
Due March 27, Week 11 (50 points each)
- h. **ASCLS - Utah Spring Seminar presentation**
Mentor must review poster organization by April 3
Last day to print poster in OUR April 7
No Blackboard submission necessary
Conference April 9-10, Week 14 (100 points)
- i. **Final draft manuscript CLS Journal.**
Due April 17, Week 15 (200 points)
- j. **Final project supply list - Excel spreadsheet.** It might take this long for the shipping charges to become available.
Due April 24, Week 15 (50 points)
- k. **Final draft manuscript ERGO.** As a requirement for this class, each group will write a manuscript for submission to ERGO, the WSU Undergraduate Research Journal. The content will be similar to the CLS Journal, however the format is quite different.
First draft due Wednesday, Week 14 (50 pts)

Each student in the class will proof two other manuscripts and submit commits electronically to the group who wrote the ERGO manuscript.
Due Monday, Week 15 (20 pts each)

Final draft due April 24, Week 15 - last day of class (200 points)

- I. **NCUR and ASCLS national conference.** Last semester, projects were selected by the CLS faculty and OUR to attend NCUR. Toward the end of March, the CLS faculty will determine which research project(s) are appropriate to present at the ASCLS national conference, July 21-25 in Chicago. Partial funding to attend the ASCLS national conference may be attained through the WSU Undergraduate Office (OUR), and is awarded on a competitive basis.