UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
COURSE OUTLINE

1. **Course: SCIENCE 501 - PROJECT COURSE IN NATURAL SCIENCES**

Lecture Section: L01 TR 14:00-15:15 **TBA** **WINTER 2018**
Instructor: Dr. R. Cartar BI 355 220-3640 cartar@ucalgary.ca
Desire 2 Learn (D2L) course name: SCIE 501 – (Winter 2018) – **PROJECT COURSE IN NATURAL SCIENCES**
USC Specialized Programs Office EEEL 426 403 220 8600 sciemail@ucalgary.ca

2. **PREREQUISITE(S):** Completion of at least 75 units (12.5 full-course equivalents) and registration in the Natural Sciences Program or consent of the Director. See section 3.5.C in the Faculty of Science section of the online Calendar (http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html).

3. **Grading:** The University policy on grading and related matters is described in sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Understanding how your assignments will be graded is key. For all assignments, we provide an assignment details sheet and the grading rubric that outlines the qualities of performance that we are looking for.

The grading scale for the course is posted on D2L. In determining the overall grade in the course, the following weights will be used:

Individual Components	*(total = 34%)*
Discussion & design Exercises	24%
Referee's report (assignment)	10%
*Group Components**	*(total = 66%)*
Letter of Intent	10%
Seminar Presentation	10%
Research Proposal	32%
Group Exercises	14%

Note: Group assignments will be weighted according to *peer evaluations* following the completion of each group assignment. Each student in a group of *n* members will allocate *n*10* points among the group members. Students will grade their contributions and those of their group members. The mean mark received by each student will be divided by 10 and applied to the student's group assignment mark ***at the instructor's discretion***. There will be 4 peer evaluations conducted throughout the term, evaluating different components of the class. Students who opt out of the teamwork component because of an inability to work successfully in a team will receive a 0.8 weighting on all 'group assignments'.

Penalty for late assignments & exercises: 10% per day (using integer days; 1 hour late = 1 day late)

Letter Grade	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Min. Percent Required	92	88	84	80	76	72	68	64	60	56	50

4. **Missed Components of Term Work:** Missed Components of Term Work: The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in . It is the student's responsibility to familiarize himself/herself with these regulations. See also of the University Calendar. Any student who is absent from classes or tutorials or fails to complete an assignment or similar set piece of work for legitimate reasons (illness, religious conviction or domestic affliction) must discuss an alternative course of action with the instructor. **Please note that the coordinator needs to be informed of any missed components within 48 hours.** Given the importance of the reviewing process and working within a team, the deadlines are very strict. **Late assignments will be penalized 10% per day. If a draft proposal is not submitted, students will not be able to participate in the review process and will forfeit the 10% allotted to the referee's report.**

5. **Scheduled out-of-class activities:** Dates and times of approved class activities held outside of class hours. None
REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY.

6. **Course Materials:** There is no textbook for this course. For some topics, links to relevant and/or assigned readings will be provided on D2L.

   Online Course Components: Some teamwork resources are provided by ITPMetrics, a University of Calgary-based system of secure web-based tools for forming teams and doing peer evaluations. These tools are free to all students and are not dependent on prior access.

7. **Examination Policy**: There will NOT be a final examination in this class.

8. **Writing across the curriculum statement:** In this course, the quality of the student's writing on assigned papers will be a factor in the evaluation of those papers. See also Section E.2 of the University Calendar.

9. **Human studies statement:** Students in the course are not expected to participate as subjects or researchers. See also Section E.5 of the University Calendar. See also http://www.ucalgary.ca/pubs/calendar/current/e-5.html.

10. **Use of living and dead organisms**: Students will not be expected to handle organisms during this course.

11. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

(a) Misconduct: Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under Section K. Student Misconduct to inform yourself of definitions, processes and penalties.

(b) Assembly Points: In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on assembly points.

(c) Student Accommodations: Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf.

Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Biological Sciences, Dr. H. Addy by email addy@ucalgary.ca or phone 403 220-3140.

(d) Safewalk: Campus Security will escort individuals day or night (http://www.ucalgary.ca/security/safewalk/). Call **220-5333** for assistance. Use any campus phone, emergency phone or the yellow phones located near most parking lot entrances.

(e) Freedom of Information and Privacy: This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also http://www.ucalgary.ca/secretariat/privacy

(f) Student Union Information: VP Academic Phone: 403 220-3911 Email: suvpaca@ucalgary.ca
SU Faculty Rep. Phone: 403 220-3913 Email: science1@su.ucalgary.ca, science2@su.ucalgary.ca and science3@su.ucalgary.ca;
Student Ombuds Office: 403 220-6420 Email: ombuds@ucalgary.ca; http://ucalgary.ca/provost/students/ombuds

(g) Internet and Electronic Device Information: You can assume that in all classes that you attend, ***your cell phone should be turned off*** unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy, you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

(h) U.S.R.I.: At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference - please participate in USRI Surveys.

SCIE 501 Learning Outcomes

I. Rationale:

The Project Course in Natural Sciences is the capstone class for the Natural Sciences Program. This is a multifaceted course designed to prepare you to practice science and to hone your critical thinking. The main project of the course is to write a multidisciplinary research proposal to a fictitious granting agency modeled after major Canadian funding agencies (e.g., NSERC, CFI, CIHR). In so doing, you will have experience formulating a tractable research question, and determining how best to approach answering it. Much of the course involves working in a group, which will allow you the opportunity to develop good teamwork skills. The course involves both written and oral presentation of your work, giving you the opportunity to hone communication skills. You will be exposed to the process of giving and receiving critical feedback on your work through class assignments. By the end of the class, you should have a better understanding of how science research is conducted, and how to communicate scientific ideas effectively.

II. Course Aims and Objectives:

Aims

In this course, you will develop and present a novel, high-level research proposal on a topic chosen collectively by your group. For guidance, several broad themes will be provided, within which you are encouraged to pursue more particular ideas you have identified from popular science, newspaper, journal or lecture sources. In the first part of the semester, your team will conduct background reading and research to develop a possible project idea for your group. Based on the individually proposed ideas, or a blend of the ideas presented, the group will collectively narrow a topic for the research proposal project.

Milestone assignments and exercises will prepare you to ultimately present the results of your investigation in a cohesive, persuasive, and substantial written proposal for research funding at the end of the semester. In this course, you will develop your critical thinking skills while learning tools of analysis and effective group-work. By developing a sound research design in your research proposal, you will increase your understanding of research principles and pitfalls. By focusing on excellence in your oral and written communication, you will develop essential skills for your academic and career development.

Specific Learning Objectives:

By the end of this course, you will have improved your abilities to:

- ✓ analyze and synthesize a large amount of diverse information on a topic,
- ✓ review a body of scientific literature, understand its limitations and what questions should be asked next,
- ✓ effectively search existing scientific literature and evaluate its significance,
- ✓ apply sound, analytical principles of research design,
- ✓ develop your oral/written communication and teamwork skills, and
- ✓ provide constructive criticism to aid others in developing their research ideas

III. Format and Procedures:

This is an inquiry-based course where you and your group will become an "expert" in your chosen field of study. Lectures, in-class activities and discussions will be aimed at giving you the tools to investigate, analyze and synthesize information in your topic area.

Attendance: Class attendance is **necessary (and will be recorded)** as the class discussions and activities are important in developing the skills outlined above. Since you will be working with a group, it is essential that you complete assigned work in a timely, professional manner. We will follow the class schedule as closely as possible and there will be opportunities for group meetings during class time. That said, you should be prepared to meet with your group, either in-person or on-line outside of class time. *Missing class meetings and out-of-class group meetings may negatively impact your grade in this course*.

Structure of the course: Class sessions will be a mixture of short lectures, activities and group discussions. Because this is an inquiry-based course, much of what you learn will depend on your own interests and work ethic. At the beginning of the course, we will introduce six general research themes that will later frame your research proposal. Students with similar interests but diverse backgrounds will be grouped into teams for the development of a proposal. You will complete a series of individual and group assignments and exercises designed help your group narrow its topic to a novel, answerable and scientifically-sound research question.

Term Project:
Your job this semester is to work in a group of ~4-5 students to write a research proposal in the form of a grant application. This course is designed to include several milestone assignments that will help you successfully complete your final major written proposal. Specific assignment details and grading rubrics are posted on D2L. The general course activities include the following:

(1) *Exercises*: Over the course of the semester, you will complete a series of short activities designed to help you focus on skill development related to specific aspects of the research proposal project. These will help to keep you and your team on track with course requirements and break up the required work into manageable pieces.

(2) *Letter of Intent*: As is common in many funding applications, your group will submit a letter of intent in advance of the actual proposal deadline. This letter tells the granting agency (your instructors) about your intended research area and includes brief background of the proposed work, including the motivation, before presenting the main research ideas of the proposed work.

(3) *Research Proposal (Draft)*: Completion of this group exercise lays the basis for your ultimate product. The proposal will include sections for summary, background, proposed research and references. This draft proposal will be circulated to members (referees) of other teams, and your instructor, for peer review.

(4) *Referee's Comments*: So what do people think? An important part of the publishing and granting process is peer review. You will read and give comments on the draft research proposal of another team. Your comments will be given to the authors to help them improve their paper before final grading.

(5) *Presentations*: Each team will present their research proposal to the class. You have a limited amount of time to make your research proposal compelling to the grant agency (and your audience).

(6) *Research Proposal (Final)*: The culmination of the course, your final project, will reflect the hard work put into your draft and will respond to the suggestions and comments made by your peers.

IV. Responsibilities and Expectations
Science 501 is a capstone course in the Natural Sciences program. Consequently, the course is both challenging and informative. The expectation is that your proposal will produce enough content, analysis, and synthesis of ideas to represent a credible effort in a postgraduate funding competition.

As a student in Science 501, you will:
- ✓ Come prepared and participate actively in class activities and student seminars.
- ✓ Read and thoughtfully consider all assigned readings.
- ✓ Complete all assignments to the best of your ability. Submit all assignments on time, whether due to your instructor or to your group; the success of your group depends it!
- ✓ Provide thoughtful, well-organized, and critical suggestions to your peers during the review process.
- ✓ Reflect on peer reviews and incorporate their suggestions into your papers. You will critically and substantially revise your paper rather than simply making grammatical and superficial changes.

What can you expect from us?
Most of this syllabus is directed at giving you information about the structure of the course, grading and assignment information and what we (the instructors) expect from you. However, we also recognize that there are certain expectations that we need to meet in order for you to have a positive learning experience in this class.

Specifically, we will:
- ✓ Be respectful of all persons in the class and create an environment where all opinions and comments are heard and valued.
- ✓ Be available outside of class time to discuss course work or other course concerns.
- ✓ Encourage you to develop both written and oral communication skills.
- ✓ Provide you with instructional material through lectures and on-line material that will enable you to excel in this class.
- ✓ Assess all assignments fairly and provide suggestions and comments for improvement.

V. Course Requirements:
Attendance and active participation in all class sessions is necessary in order for you to get the full benefit of our discussions.

Communication of materials for grading:
Materials in the class will be transmitted between instructor and students by email. It is the student's responsibility to ensure that their emails are properly sent, and files are attached. If files are bigger than 3 Mb, please reduce their size (usually the size of their graphics) or post them in cloud location like DropBox and send the instructor the link.

Course readings:
Background readings: Readings will be provided on D2L. You should download, read and bring handouts to class.
There is no required textbook for this class.

VI. Grading Procedures
Understanding how your assignments will be graded is key. For all assignments, we provide an assignment details sheet and the grading rubric that outlines the qualities of performance that we are looking for.

Program Approval: Approved by the Program Director (W. Benoit) Date: _____

Associate Dean's Approval for
alternate final exam arrangements: Approved by the Associate Dean (N. Chibry) Date: _____