INSTRUCTORS:

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Room</th>
<th>Ext</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Carolyn Eyles</td>
<td><a href="mailto:eylesc@mcmaster.ca">eylesc@mcmaster.ca</a></td>
<td>Thode 308A</td>
<td>24077</td>
</tr>
<tr>
<td>Devon Jones</td>
<td><a href="mailto:jonesde2@mcmaster.ca">jonesde2@mcmaster.ca</a></td>
<td>GSB 114</td>
<td>21799</td>
</tr>
</tbody>
</table>

INSTRUCTIONAL TEAM:

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Room</th>
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<tbody>
<tr>
<td>Ellis, Russ</td>
<td><a href="mailto:ellisr@mcmaster.ca">ellisr@mcmaster.ca</a></td>
<td>GSB 114</td>
<td>21503</td>
</tr>
<tr>
<td>Harvey, Chad</td>
<td><a href="mailto:harvech@mcmaster.ca">harvech@mcmaster.ca</a></td>
<td>Thode 306B</td>
<td>21565</td>
</tr>
<tr>
<td>Symons, Sarah</td>
<td><a href="mailto:symonss@mcmaster.ca">symonss@mcmaster.ca</a></td>
<td>Thode 306A</td>
<td>21641</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE SUPPORT:

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Email</th>
<th>Room</th>
<th>Ext</th>
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<tbody>
<tr>
<td>Misiak, Rebecca</td>
<td>Academic Advisor</td>
<td><a href="mailto:misiakr@mcmaster.ca">misiakr@mcmaster.ca</a></td>
<td>GSB 105D</td>
<td>21181</td>
</tr>
<tr>
<td>Robinson, Sarah</td>
<td>Administrator</td>
<td><a href="mailto:sjrobin@mcmaster.ca">sjrobin@mcmaster.ca</a></td>
<td>GSB 105F</td>
<td>20841</td>
</tr>
</tbody>
</table>

MSAF Submissions: (an address only for use on MSAF form)

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Room</th>
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<tbody>
<tr>
<td></td>
<td><a href="mailto:4a12msaf@mcmaster.ca">4a12msaf@mcmaster.ca</a></td>
<td></td>
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</table>

COURSE DESCRIPTION:

ISCI 4A12 is a 12 credit course open only to students in Level IV of the Honours Integrated Science program. The course consists of a 9-unit thesis component and 3-unit seminar component. ISCI 4A12 aims to:

- Provide students with the opportunity to conduct original research under the supervision of a full-time or associate faculty member of McMaster University;
- Engage students in collaborative discussion regarding individual research topics;
- Develop student skills in the areas of research question formulation, research design, experimentation and/or field data collection, analysis of data and communication of research findings;
- Develop student skills in the areas of research proposal writing, literature review, peer review, science communication, illustration of research findings, and thesis writing;
- Challenge students to present and defend their research findings to faculty and the general public in an oral presentation at the end-of-year iSci Symposium and in relevant departmental symposia;
- Assist students in the preparation of materials for post-graduate opportunities (e.g. graduate school, professional school and scholarship applications).

Program Website: [http://www.science.mcmaster.ca/isci/](http://www.science.mcmaster.ca/isci/)

Avenue to Learn site: [http://avenue.mcmaster.ca/](http://avenue.mcmaster.ca/)
LEARNING OBJECTIVES:
Throughout the course, you will be developing a range of skills including: research skills, team work, leadership, communication skills, information literacy, experimental design, critical thinking, data analysis, numeracy, and math literacy.

CLASS ACTIVITIES:
The weekly course timetable will be posted on Avenue. The course calendar (a Google Calendar) on Avenue will supersede all other calendars including MosaIC. Any schedule changes will be announced on Avenue.

Check the Avenue course site daily.

You must be prepared to be present at all of the times indicated for iSci classes, including iConS, workshops, and invited speaker seminars.

Format
Course requirements:
This course takes place over two terms, usually the Fall and Winter terms. The course consists of a 9-unit thesis component and 3-unit seminar component. The time commitment students need to allocate to this course will vary with the project, supervisor and student. As a general rule, students should expect to spend a minimum of 15 hours per week, with more time allocated to research early in the first term and to analysis and writing in the second term. It is not unusual for supervisors to require more than 15 hours per week, including time during evenings and weekends. Ideally, the experimental phase of the project should be completed by the end of January so that the remaining time in February and March can be devoted to analysis, writing and editing. All laboratory or field work must cease by early February to allow for data analysis, writing and submission of the thesis.

OFFICE HOURS:
Instructors will hold office hours and communicate via Avenue when and where these take place.

REQUIRED TEXTS & MATERIALS:
No text required

COURSE SCHEDULE:
Schedule of Activities
A preliminary schedule for the fall and winter terms will be provided. These activities will include information on writing research proposals and literature reviews, scholarship and graduate school applications, professional etiquette, career opportunities and job search, creating effective graphics and illustrations, and publishing ethics. A series of workshops will also be offered on CV writing, writing reflections, interview skills, and data analysis.

Term 2: Class times: TBA
Location: ThInK classroom.

ASSESSMENT:
Course Components and Grading Scheme
Students in the course are evaluated on the basis of the following components:

A. Thesis component (150 points: equivalent to 9 units)
### Research component (50 points: equivalent to 3 units)

<table>
<thead>
<tr>
<th>Component</th>
<th>Suggested Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research proposal (due Monday, October 7, 2019, 16:30)</td>
<td>5% (7.5 points)</td>
</tr>
<tr>
<td>Literature review (due Monday, November 11, 2019, 16:30)</td>
<td>15% (22.5 points)</td>
</tr>
<tr>
<td>Draft (due Monday, March 16, 2020, 16:30)</td>
<td>10% (15 points)</td>
</tr>
<tr>
<td>Written Thesis (due Tuesday, April 7, 2020, 16:30)</td>
<td>40% (60 points)</td>
</tr>
<tr>
<td>Work performed to collect &amp; analyze data (e.g. activities performed in the laboratory or field or using or generating data on computers). Marks due to Course Administrator - noon (12:00), Friday, April 17, 2020</td>
<td>20% (30 points)</td>
</tr>
<tr>
<td>Oral presentation at the Integrated Science Symposium</td>
<td>10% (15 points)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100% (150 POINTS)</td>
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All laboratory experimentation must be completed early in the second term and will form the basis of the draft. The supervisor MUST attend the presentation session during the iSci Symposium to ask questions of the student, and to grade the student on this component. Other members of the iSci instructional team may also contribute to the evaluation of the student’s oral presentation. After the supervisor provides comments on the first draft of the thesis, the student must make the corrections and submit the final thesis in a pdf format to the Course Administrator. If permission is granted by the supervisor, the document will be posted on the web or else archived in electronic format by the program.

*Any modifications of the mark breakdown for the thesis must be discussed and approved by the supervisor, student and Course Coordinator.*

*Any change in submission deadline for any component of the thesis must be justified at least 5 days in advance, in writing to the Course Coordinator. The Coordinator will penalize late submissions by up to 5% per day.*

### B. Seminar component (50 points: equivalent to 3 units)

<table>
<thead>
<tr>
<th>Component</th>
<th>Suggested Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 1: Participation</td>
<td>16% (8 points)</td>
</tr>
<tr>
<td>Peer review of research proposals</td>
<td>12% (6 points)</td>
</tr>
<tr>
<td>Peer review of literature review</td>
<td>16% (8 points)</td>
</tr>
<tr>
<td>Professional development: 2 ‘reflections’ @ 2 points each</td>
<td>8% (4 points)</td>
</tr>
<tr>
<td>Term 2: Participation</td>
<td>16% (8 points)</td>
</tr>
<tr>
<td>Peer review of one thesis draft</td>
<td>12% (6 points)</td>
</tr>
<tr>
<td>Abstract for ‘public’ audience</td>
<td>12% (6 points)</td>
</tr>
<tr>
<td>Professional development: 2 ‘reflections’ @ 2 points each</td>
<td>8% (4 points)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100% (50 POINTS)</td>
</tr>
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</table>
PASS-FAIL CRITERIA BY COMPONENT
Passing ISCI 4A12 requires passing (i.e. grade of 50% or higher) BOTH the Thesis AND Seminar components

ABSENCES & MISSED WORK:
If you are absent from the university for a minor medical or personal reason, lasting up to 3 calendar days, you may report your absence, once per term, without documentation, using the McMaster Student Absence Form (MSAF). MSAF is available in MOSAIC Student Center (in the drop down menu under Academics). Absences of a longer duration (>3 days), and/or for work worth more than 25% of the final grade, and/or if you have already submitted an MSAF request for the term, must be reported to the Office of the Associate Dean of Science (BSB 129), with documentation, and relief from term work may not necessarily be granted. When using the MSAF, you MUST use 4a12msaf@mcmaster.ca as the contact e-mail for your ISCI 4A12 work. You MUST ALSO contact Devon Jones at jonesde2@mcmaster.ca within 48 hours by email. If you do not, your MSAF may not be granted. You must then contact the Course Coordinator and your Thesis Supervisor immediately (normally within 2 working days) by email. Your Course Coordinator will indicate what relief may be granted for the work you have missed, and relevant details such as revised deadlines, or time and location of a make-up assignment. An MSAF is a request for individual consideration: understand that an instructor may respond with an individual solution. Please note that the MSAF may not be used for final thesis deliverables.

Absence from iConS, Invited Speaker Seminars, or Workshops: If you are absent from any scheduled ISCI 4A12 session, it is your responsibility to make up missed work. If you are absent from a scheduled session that has an associated piece of assessment (e.g. reflection exercise, presentation) without authorization your mark will be recorded as 0 (see Procedure for authorized absence above).

Missed deadlines
Any late submissions will result in a penalty of 20% per day unless faculty members are notified of any problems in advance and approve of a late submission. It is left to the discretion of the instructor to determine if accommodations will be made. This holds for both group and individual assignments.

CHECKING YOUR GRADES and RE-MARK POLICY
You will have one week from the date that an assessed piece of work (or test or mid-term exam) is returned to you to appeal your mark. If you wish to appeal a grade, you must submit to the Supervisor/Course Coordinator a written note justifying why you wish to have the work remarked, with the associated piece of work attached. If Course Coordinator considers the written justification to be insufficient (e.g. simply wanting a higher grade is insufficient), the assignment will not be re-graded. If the justification is considered sufficient, the entire assignment will be re-graded. You must therefore understand that your mark can increase or decrease.

Your marks will be recorded on Avenue. It is your responsibility to check that all grades entered into Avenue are recorded properly. You must notify your Supervisor/Course Coordinator about any errors with regards to how your mark was entered. You have until 48 hours prior to the end of term to discuss any Avenue mark issues.

COMMUNICATION BETWEEN STUDENTS AND THE INSTRUCTIONAL TEAM
Any e-mails addressed to faculty must have a brief, relevant subject line, must come from a mcmaster.ca e-mail account and must copy in all relevant parties (e.g. other markers, other group members). All e-mail communication addressed to students will be sent to their mcmaster.ca e-mail account.

All assignments must be handed in via Avenue, in the specified file format (usually pdf). Author(s) name(s) and group designations, if applicable, must be clearly marked on the first page of the work handed in. Submitted files must be named in a way to easily identify the assignment and the author and/or group designation.

Work that is late, handed in to the wrong person, inadequately identified, or in the wrong format, risks losing marks. Instructors will endeavour to return marked materials within two weeks of hand-in.
PLAGIARISM DETECTION

In this course, we will be using a web-based service (Turnitin.com) to reveal plagiarism. Students will be expected to submit their work electronically to Turnitin.com and in hard copy so that it can be checked for academic dishonesty. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to

https://www.mcmaster.ca/academicintegrity/turnitin/students/index.html

POLICY ABOUT ONLINE ACCESS OR ONLINE COURSE WORK REQUIREMENTS

In this course we will be using e-mail, Avenue, and PebblePad. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

RESPONSIBILITIES OF THE SUPERVISOR

Supervisors are responsible for the immediate direction and instruction of the student and should commit on average, a minimum of 30 minutes of contact time each week with the student. Supervisors will communicate their own expectations in terms of the day-to-day conduct of the student in the laboratory/clinic/field, as well as protocols used to track research progress and to collect data (i.e. use of lab or field notebooks, etc.). Since it is impractical to insist on a single format for all disciplines and project types, supervisors are responsible for setting guidelines and terms of reference for the research proposal or literature review for their own students. These should be provided to the students early in the first term. The supervisor should also provide regular oral or written feedback to the student in regards to level of productivity, and degree of satisfaction of the student’s progress. Students should be clear on what is expected of them throughout the course.

All research conducted by students as part of their thesis must comply in spirit as well as in fact with the Tri-Council Policy for Research Ethics. All projects to be undertaken that may involve human or animal participants must be subject to Research Ethics Screening and Approval. It is incumbent upon every supervisor to ensure that every student conducts work safely, and that all necessary equipment has been made available. Supervisors must ensure that appropriate safety training has been taken by all students before they commence laboratory or field work. This includes at minimum taking WHMIS core training, and may include other additional training as determined by the supervisor.

It is important for supervisors to track the progress of the students regularly throughout the term, and to ensure that laboratory work does not continue beyond February. In the event that experiments do not generate hoped-for results, the supervisor should not expect students to start anew on a different project in mid-course. It is the responsibility of the supervisor to ensure that students have sufficient time to complete their analysis, writing and editing of the first draft, in time for final submission of the thesis by early April. The supervisor will also be responsible for evaluating the student’s performance in the collection and analysis of their data. This evaluation will be submitted at the same time as the evaluation of the written thesis.

RESPONSIBILITIES OF THE STUDENT

It is the responsibility of the student to keep the supervisor up-to-date throughout the year regarding progress on the project and any change in the project topic or proposal. We recommend that the student organize a meeting with their supervisor before handing in their Research Proposal to discuss the nature and scope of their project. During this meeting the student should also discuss expectations for the research proposal, literature review, draft, final thesis and laboratory or field component of their grade. If appropriate, the student may request to see copies of theses completed by former thesis students. The grade sheet for the Proposal, Literature Review and Draft must
be signed by the student; this ensures that the student obtains appropriate feedback and is aware of the grade attained for each component. If the supervisor does not notify the student of his/her grade within one week of the due date for return of the grade sheet (see List of Important Dates), the student should inform the Course Administrator. A student can direct any issue of a scientific nature to the supervisor at any time; however, if conflicts arise that cannot be solved between the student and supervisor it is the responsibility and right of the student to ask the Course Coordinator to intervene.

Appropriate safety training must be completed before the student commences any laboratory or field work. This includes at minimum completing WHMIS core training, and may include other additional training as determined by the supervisor. The student is responsible for providing confirmation of training dates and location of training to the Course Administrator no later than Friday, September 13, 2019.

The level of student participation in this course is much higher than traditionally-taught courses. To get the most out of the course, you must be prepared to:

- attend all sessions, make up all missed work for all absences, and provide documentation for authorized absences;
- interact frequently with your thesis supervisor, Course Coordinator and Administrator;
- plan and manage your own time;
- complete preparatory tasks (such as reading, writing assignments, and initial research) in advance of sessions;
- develop and use reflective learning skills (for example identifying learning objectives, planning and carrying out research tasks, acting on academic feedback);
- work as an effective, efficient, and responsive member of the ISCI 4A12 class;
- check the course Avenue site and your McMaster e-mail daily for updates;
- review, understand and abide by the ISCI 4A12 Student Responsibilities Contract; and
- follow all university policies and guidelines, and in all ways be a responsible university member.

RESPONSIBILITIES OF THE COORDINATOR & ADMINISTRATOR

The Course Coordinator & Administrator deal with the functional aspects of the course and initially determine if a student should be allowed to register in ISCI 4A12.

There will be an initial meeting in September, during which all students will meet with the Course Coordinator & Administrator to discuss course expectations and deadlines. All students in the course can meet throughout the year with the Coordinator and/or Administrator to discuss various issues relating to deadlines, course requirements, etc. and to get guidance on time management and how to communicate effectively with the supervisor. Conversely, supervisors may discuss any issue arising during the course of the project with the Coordinator & Administrator. The Coordinator can provide individual counseling if problems cannot be solved between student and supervisor.

The Course Coordinator & Administrator will also maintain an Avenue to Learn shell (http://avenue.mcmaster.ca) for the course and use it to remind students of important deadlines, to provide updates about the organization of the course, and to update the online grade book. It is also the responsibility of the Course Coordinator to impose heavy penalties for any deadline missed by the student, in the submission of course materials. Finally, in the rare event of a disagreement between the supervisor and the student over the marking of the written thesis, it is the responsibility of the Course Coordinator to find a faculty member in the supervisor’s area of expertise who will remark the written thesis.

The Administrator is responsible for handling the application forms submitted (in the preceding academic year) by students intending to enrol in this course, to make sure that students meet prerequisites and to assist the Coordinator in managing the enrolment of students in ISCI 4A12.
The Course Administrator may also assist the Course Coordinator with their duties (outlined in the paragraphs above), as needed. The Course Administrator is finally responsible at the end of the year to handle the archival of the written thesis submitted by each student.

ETHICS APPROVAL

Animal Care Approval
All students conducting research involving animal subjects must complete the appropriate animal care course before beginning their thesis research and no later than September 14, 2018. It is the responsibility of the thesis supervisor to email the Course Coordinator by September 14 that the animal care course has been completed.

Human Ethics Approval
The Tri-Council Policy Statement, “Ethical Conduct for Research Involving Humans,” describes the policies of the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council (NSERC), and the Social Sciences and Humanities Research Council (SSHRC). This current policy took effect September 1, 1999. Research requiring review includes not only experimental protocols, but also research involving naturalistic observation, questionnaires, interviews, and secondary use of data that are not in the public domain. For further information regarding human ethics policies and resources, visit: [http://www.mcmaster.ca/ors/ethics/](http://www.mcmaster.ca/ors/ethics/). All ethics applications should be submitted to the McMaster Research Ethics Board secretary, Michael J. Wilson, ethicsoffice@mcmaster.ca. Applications will then be sent to the appropriate committee for review. Research may not begin until the University Research Ethics Board has given its approval. The application will be approved only for the academic year in which it is made. If the project will continue in a subsequent year without any change, the applicant needs to request renewal of the approval.

Pre-Placement Immunization Form
If a student’s thesis research will be conducted in a hospital setting (e.g., Chedoke, St. Joseph’s Hospital, McMaster Medical Centre etc.), the student is required by Ontario law to complete a Pre-placement Immunization Form prior to any research collection. This is a medical history of immunizations (e.g., Rubella, Red Measles, Hepatitis B, Diphtheria). If an individual’s immunizations are not up to date, they will be required to obtain these vaccinations, which may result in multiple doctor appointments and possible fees (if they are not covered by medical insurance).

SENATE STUDENT POLICIES

Senate Policy Statements are also available from the Senate Secretariat Office, Room 104, and Gilmour Hall.

Academic Integrity

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty.

The following illustrate only four of many forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained;
- copying or using unauthorized aids in laboratory exercises
- improper collaboration in group work; and,
- copying or using unauthorized aids in quizzes, tests and examinations
All students are reminded of the importance of academic integrity, and the serious consequences of academic dishonesty.

**Student Code of Conduct**


You acknowledge that your behavior in all aspects of this course should meet the standards of the McMaster University Student Code of Conduct. You understand that any inappropriate behavior directed against any of your colleagues, teaching assistants, or the instructional team will not be tolerated. Disruptive behavior during any session (e.g., lecture, seminar, lab, tutorial) such as talking, sleeping or non-class computing while an individual presents information, or constantly being late, will also not be tolerated. Abuse, ridicule, slander, inappropriate language, and discrimination towards instructors, teaching staff, teaching assistants and other students will not be tolerated in any capacity. Shared spaces including e-spaces such as the Avenue to Learn course discussion board are to be considered inclusive and safe.

**Copyright Policy**

In this course you will have access to material that is subject to copyright laws. This includes (but is not limited to) textbooks and all resources developed by the instructors such as lab manuals, demonstration videos, quizzes, assignments, tests, class notes and class slides. Under no circumstance are you allowed to share or redistribute this material in any printed or electronic form without the explicit written consent of the copyright holder. This includes posting any course material on Internet bulletin boards, course repositories, social networks, etc.

**McMaster Accommodation for Religious, Indigenous and Spiritual Observances Form (RISO):**

At the beginning of EACH term, visit the website of the Office of the Associate Dean (Academic) https://www.science.mcmaster.ca/associatedean/current-students/procedures-forms.html if you need accommodations for religious, Indigenous and/or spiritual observances. Follow the procedure explained there under “Accommodation for Religious, Indigenous and Spiritual Observances Form (RISO)

**Inclusivity and Accommodations:**

McMaster University aims to foster a supportive, inclusive learning environment that will encourage both individual and collective growth. Students are required to register with Student Accessibility Services (SAS) first (https://sas.mcmaster.ca/). Any student who then wishes to invoke an accommodation for any aspect(s) of this course must contact the instructor at the beginning of the semester to discuss how the accommodations detailed in their SAS letter will be fulfilled in this course.

**The instructors and the university reserve the right to alter this outline if necessary.**

**Extreme circumstance**

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.