1 Course Details

1.1 Calendar Description
The main objective of this course is to familiarize students with general concepts in cancer biology. Each topic is presented as an overview, emphasizing recent developments in the field. There is additional focus on developing scientific skills, including critical analysis of current literature and the ability to give logical and concise oral presentations.

Pre-Requisite(s): MBG*2040, MCB*2050, (1 of BIOM*3040, BIOM*4070, ZOO*3000)

1.2 Course Description
Rationale:
Cancer is one of the major afflictions of mankind, and causes a significant number of deaths worldwide. In recent years, our knowledge about the origin of cancer and on how it progresses to become life threatening has significantly increased. Descriptive knowledge has been replaced with mechanistic understanding of cancer behavior at the molecular, cellular, organ and organism levels. Concomitant with the development of this extensive body of knowledge has been the development of scientists devoted to elucidate and solve problems in cancer biology. The aim of these scientists is to become allies with the clinical oncology sciences to improve cancer prevention, detection, diagnosis and treatment. The department of Biomedical Sciences wishes to participate in this worldwide initiative by offering students the possibility of learning about cancer biology, thus increasing their interest in the field and the probability of forming professionals dedicated to the study of this discipline.

1.3 Timetable
Timetable is subject to change. Please see WebAdvisor for the latest information.

1.4 Final Exam
Exam time and location is subject to change. Please see WebAdvisor for the latest information.

2 Instructional Support

2.1 Instructional Support Team

Instructor: Byram Bridle Dr.
Email: bbridle@uoguelph.ca
Telephone: +1-519-824-4120 x54657
Office: PAHL 4834

Instructor: Brenda Coomber Dr.
Email: bcoomber@uoguelph.ca
Telephone: +1-519-824-4120 x54922
Office: OVC 3645

Instructor: Anita Luu
Email: aluu@uoguelph.ca
Telephone: +1-519-824-4120 x54685
Office: OVC 3649

Instructor: Roger Moorehead Dr.
Email: rmoorehe@uoguelph.ca
Telephone: +1-519-824-4120 x54950
Office: OVC 3626

Instructor: Anthony Mutsaers Dr.
Email: mutsaers@uoguelph.ca
Telephone: +1-519-824-4120 x54068
Office: OVC 3644

Instructor: James Petrik Dr.
Email: jpetrik@uoguelph.ca
Telephone: +1-519-824-4120 x54921
Office: OVC 3627

Instructor: Sarah Wootton Dr.
Email: kwootton@uoguelph.ca
Telephone: +1-519-824-4120 x54729
Office: PAHL 4836

Course Co-ordinator: Alicia Viloria-Petit Dr.
Email: aviloria@uoguelph.ca
Telephone: +1-519-824-4120 x54925
Office: OVC 3647

3 Learning Resources
3.1 Recommended Resource(s)


3.2 Additional Resource(s)

Access to online journals in the cancer and biomedical sciences fields. (Website)

Additional Resource Readings (Readings)
Selected readings chosen from cancer research literature online.

4 Learning Outcomes

The overall aim of this course is to familiarize students with general concepts in cancer biology and how these concepts apply to the clinical definition and management of the disease. By engaging students in the preparation of a seminar and a literature review on a cancer biology topic of current interest, and in the discussion of a variety of cancer biology subjects, this course will ultimately provide students with a critical overview of cancer and its biology, and with an understanding of the relevance of research to the improvement of cancer prevention, diagnosis, prognosis, and treatment.

4.1 Course Learning Outcomes

By the end of this course, you should be able to:
1. Have a historical perspective and basic general knowledge of the most commonly studied topics in cancer biology.
2. Know and understand the fundamentals of the most common methodologies currently used in cancer research.
3. Link specific cancer biology topics with clinical aspects of the disease, including prevention, diagnosis, prognosis and treatment.
4. Provide critical assessments, as a result of your independent research on an assigned cancer biology topic, and by your active participation in weekly tutorial discussions.
5. Give logical and concise oral presentations.
6. Write a critical scientific review.

5 Teaching and Learning Activities

Class location and meeting times:

Monday and Wednesday 2:30 pm -3:50 pm, Room: MCKN 230
2-hour tutorial on Friday 9:30 am -11:20 am, Room: MCKN 229
Maximum class size: 50 students

**Format and Procedures:**

This is a lecture-based course, with a weekly seminar-based tutorial. Students are expected to participate in tutorial discussions and to conduct themselves in a scholarly and respectful manner at all times.

### 5.1 Lecture

**Mon, Jan 7 - Fri, Jan 11**

**Topic(s):** The Nature and Hallmarks of Cancer

No seminar-based tutorial on this specific week or unit.

Instructor: Alicia Viloria-Petit

**Mon, Jan 14 - Fri, Jan 18**

**Topic(s):** Control of Cell proliferation, Cell Cycle and Cell Death

Instructor: Brenda Coomber

**Mon, Jan 21 - Fri, Jan 25**

**Topic(s):** Tumor Immunology

Instructor: Byram Bridle

**Mon, Jan 28 - Fri, Feb 1**

**Topic(s):** Cancer Virology

Instructor: Sarah Wootton

**Mon, Feb 4 - Fri, Feb 8**

**Topic(s):** Growth Factors, Receptors and Cancer

Instructor: Roger Moorehead

**Mon, Feb 11 - Fri, Feb 15**

**Topic(s):** Tumor Angiogenesis

Instructor: Jim Petrik

**Mon, Feb 25 - Wed, Feb 27**
**Topic(s):** Tumor Invasion and Metastasis

No seminar-based tutorial this week because of midterm. Seminars on this unit to be presented together with those on cancer stem cells during next week's tutorial.

Instructor: Alicia Viloria-Petit

**Fri, Mar 1, 9:30 AM - 11:00 AM**

**Topic(s):** *Midterm Exam*

*Units 1-6*

*Room: MCKN 229*

Instructor: Alicia Viloria-Petit

**Mon, Mar 4 - Fri, Mar 8**

**Topic(s):** Cancer Stem Cells

Instructor: Alicia Viloria-Petit

**Mon, Mar 11 - Fri, Mar 15**

**Topic(s):** Carcinogenesis, DNA Damage, and DNA Repair

Instructor: Anita Luu

**Mon, Mar 18 - Fri, Mar 22**

**Topic(s):** Cancer Genetics and Epigenetics

Instructor: Alicia Viloria-Petit

**Mon, Mar 25 - Fri, Mar 29**

**Topic(s):** Cancer Metabolism

Instructor: Alicia Viloria-Petit

**Mon, Apr 1 - Wed, Apr 3**

**Topic(s):** Clinical Oncology

No seminar-based tutorial on this specific week or unit.

Instructor: TBA
Fri, Apr 5

Topic(s): TBA

Invited Speaker: TBA

Topic(s): Final Exam

Units 7-12

Time and Room: TBA

Instructor: Alicia Viloria-Petit

6 Assessments

6.1 Assessment Details

Tutorial Participation (10%)
For 10 of the units covered in the lectures, students will attend a 2-hour tutorial, where up to five students will give oral presentations on an assigned topic, while all the students in the course will participate in discussions.

Due Date: Friday of each week, except for holidays and the day assigned to the invited speaker; see below for details.

Tutorial details and evaluation

1. Each seminar-based tutorial will consist of a maximum of 5 oral presentations and their corresponding discussion, involving presenter and attendant students.
2. The duration of the presentation is 12-15 minutes, followed by a 5-10 minutes discussion period, depending on the number of students registered in the course.
3. During the discussion period, the attendants will ask questions to the presenters and/or provide comments, and this will be modulated and evaluated by the course coordinator.
4. The presentation will be evaluated by 2 instructors: the course coordinator and another instructor with expertise in the subject area. The final grade will be calculated as follows:
   • If the difference between the two grades is less or equal to 4 marks, the
final grade will be the higher of the two independent grades.
• If the difference between the two grades is higher or equal to 5 marks, the final grade will be the average of the two independent grades.

5. Discussion participation will be evaluated by the course coordinator.

Midterm Exam (20%)
Date: Fri, Mar 1, 9:30 AM - 11:00 AM, MCKN 229
This will cover units 1 to 6. The exam will be written and will consist of a small multiple-choice component, in addition to a significantly larger component where the students will give short- to medium-length answers to specific questions.

Final Exam (30%)
This will cover units 7 to 12. The exam will be written and will have the same format as the midterm exam, in addition to a bonus question related to the topic covered by the invited speaker.

Day, Time, and Room: TBA

One oral presentation (seminar) on assigned topic (20%)
Students will be assigned a topic by alphabetical order and they will give an oral presentation and will write a literature review on this topic.

The topic will be assigned from the general subjects covered by 10 of the course units, on Friday January 11, 2019.

Due Date: Every Friday, starting on January 25, 2019. Exact date for each student will depend on the topic (see below for details and guidelines).

Seminar guidelines (see evaluation form on page 6)

1. It is strongly advised that students make an appointment with the instructor of the unit of the assigned topic, at least one week before their seminar presentation. An outline of their presentation should be ready for this appointment, which is intended to ensure that the student is approaching the topic as indicated by the title, and to suggest ideas to improve the presentation, as needed.

2. The duration of the seminar is 12-15 minutes, followed by a 5-10 minutes discussion period.

3. Among the basic features, the power point presentation should:
   • Outline the points to be discussed, which should flow in a logic and cohesive manner
   • Provide an introduction with the conceptual and/or historical basis of the
topic
• Consist of clear, concise and easy to follow slides. This can be achieved by using slide formats with clean color contrasts, visible font sizes and guiding titles, and by avoiding excessive writing or excessive number of figures within a single slide.
• Present supporting data from original research articles (cited in the same slide where the data is presented).
• Include a summary or conclusion, and future directions.

4. For the actual oral presentation and to facilitate the transmission of information and fairness among speakers, it is encouraged to:
• Speak with adequate tone and pace of voice (loud enough to be heard by the whole room, and at a rate that allows your audience to understand what you are saying).
• Use the pointer to guide the audience.
• Stick to the time limit.

One literature review on same assigned topic (20%)
Students will be assigned a topic by alphabetical order and they will give an oral presentation and will write a literature review on this topic.

The topic will be assigned from the general subjects covered by 10 of the course units, on Friday January 11, 2019.

Due Date: Every Friday, starting on January 25, 2019. Exact date for each student will depend on the topic (see below for details and guidelines).

Guidelines for preparation and evaluation of literature review (see evaluation form)

1. The manuscript should be double-spaced, with 12-point characters, and a one-inch margin on each side of the document.
2. The manuscript should be at least 8 pages long and no more than 10 pages long. The last page should be a full page, and the title page will not be counted as part of the aforementioned page limit.
3. Any discussion of published findings; theories and hypotheses must be accompanied by a citation, regardless of whether or not you quote it directly. At least 10 original sources (references) must be cited. Sixty percent (60 %) of these references must be primary articles (i.e., the original study, no a literature review). The course textbook will not be included among the original sources. The reference page will not be counted as part of the 10-page limit.
4. Figures or tables are not necessary but can be included, if they truly improve the thesis of the manuscript. A maximum of 2 items (figures and/or tables) can be included. They should be placed after the main text but before the reference page, and will not be included in the total page count.

5. Citations should follow the rules from the *Proceedings of the National Academy of Sciences, USA*; which are as follows:

   “References should be cited in numerical order as they appear in text. Because tables and figures will be inserted in the text where first cited, references in these sections should be numbered accordingly. **Include the full title for each cited article.** Authors must translate foreign language titles into English, with a notation of the original language. All authors (unless there are more than 5) should be named in the citation. If there are more than 5, list the first author's name followed by et al. Provide inclusive page ranges for journal articles and book chapters. **Cite databases in the text or as footnotes.**

   **Journal articles are cited as follows:**


   For correct abbreviations of journal titles refer to *Chemical Abstracts Service Source Index* (CASSI).

   **Articles or chapters in books are cited as follows:**


6. The literature review due date is **one week after the assigned date for oral presentation, on Friday at 5 pm**. Students will upload a PDF version of their review to a Dropbox folder, named with the number and title of the unit corresponding to each week. This folder will become available to authorized students on the Thursday prior to the seminar date, at noon.

7. The penalty for late reviews is **2 marks per day (including weekends) for a maximum period of one week**. Reviews submitted later than a week after the due date will not be accepted and will not be evaluated.

6.2 Oral Presentation Evaluation Form
Evaluation system: a grade of 1 to 5 will be assigned to each of the specified rubrics.

1 = Poor
2 = Marginally adequate
3 = Adequate
4 = Good
5 = Excellent

<table>
<thead>
<tr>
<th>Insight and ideas</th>
<th>25%</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Quality of the presentation</td>
<td>25%</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Organization of the seminar</td>
<td>25%</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Address of target audience</td>
<td>15%</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Timing</td>
<td>10%</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Note**: Contribution of each rubric to the final mark is specified as percentage.

Comments:
6.3 Literature Review Evaluation Form

Student name:                      Date:
Seminar title:                     

Evaluation system: a grade of 1 to 5 will be assigned to each of the specified rubrics.

1= Poor
2= Marginally adequate
3= Adequate
4= Good
5= Excellent

Final grade: /100

<table>
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<tr>
<th></th>
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<td>Insight and ideas</td>
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<tr>
<td>Choice and use of evidence</td>
<td>20%</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Integration of source material</td>
<td>20%</td>
<td>1</td>
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<tr>
<td>Use of presentation formats</td>
<td>20%</td>
<td>1</td>
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</tr>
<tr>
<td>Address of target audience</td>
<td>10%</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Grammar and style</td>
<td>10%</td>
<td>1</td>
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</table>

**Note:** Contribution of each rubric to the final mark is specified as percentage.

Comments:
7 Course Statements

7.1 Course Evaluation

Students will be asked to complete a questionnaire on the instructors’ teaching abilities. This information is required by the university to evaluate faculty performance for purposes of Tenure, Promotion and Selective Increases. Administered by a third party rather than the instructors, these evaluations will be delivered to the instructors only after the final grades have been submitted to the Registrar’s Office. The numerical ratings from the form will be made available to the Chair for administrative purposes. If a student wishes the Chair to see his/her written comments in addition to the scores, he/she must include with those comments his/her name (legibly printed) and signature.

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Graduate Calendar - Grounds for Academic Consideration
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

8.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for course registration are available in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Graduate Calendar - Registration Changes
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-regregchg.shtml
8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

More information can be found on the SAS website https://www.uoguelph.ca/sas

8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University’s policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

Graduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml
8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph’s procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
https://www.uoguelph.ca/academics/calendars