

Cancer Biology (3 credits)

Spring 2021 BIOL 566

7:20 -10:00 pm Monday remotely via zoom

Instructor: Dr. Yuliya Dobrydneva

Email: ydobrydn@gmu.edu

Office hours : TBA by appointment only

Class meets on Zoom Mondays 7.20 -10.00 pm

Course objectives: This course in cancer genomics will review the modern concepts in cancer biology. We will discuss histological and molecular taxonomy of human tumors, and common syndromes associated with increased probability of tumor development. We will highlight genomic instability as a central player that is important for cancer initiation, progression and response to chemotherapeutic agents. We will go through both position-dependent and position-independent strategies allowing one to discover genes involved in human tumor development. We will also focus on high-throughput methods of cancer research, including various methods of expression profiling. A systematic review of molecular pathways involved in cancer development will be presented in the course. This will involve a detailed study of molecular consequences of oncogene activation and tumor suppressor gene inactivation. We will untangle the molecular network underlying cell death and cell proliferation in cancer, as well as tumor cell invasion, migration and induction of angiogenesis. Also, we will review examples of therapeutic agents that specifically "target" tumor cells in order to prevent, diagnose, treat, and provide follow-up surveillance of cancer.

Text: The Biology of Cancer by Robert A. Weinberg, Garland Science, any edition. Kindle edition is available.

Additional reading:

Hanahan D, Weinberg R. The Hallmarks of Cancer. <https://doi.org/10.1016/j.cell.2011.02.013>

Please stay tuned for additional reading as it may be posted on Bb. Announcements with updates will be posted regularly!

Where to find course materials: Content of your weekly works, including lectures, quizzes and other assignments will be posted on Bb under a tab "weekly sessions". Each week has its own folder (week 1, week 2 etc).

Course evaluation methods and Grading:

Weekly quizzes, weighted evenly	20%
Exam I	20%
Exam II	20%
Exam III	20%
Final Exam (cumulative)	20%

- All exams and quizzes are administered via Bb.
- All exams and quizzes are open book, open notes, open everything and timed.
- The final exam will be given according to the university schedule.
- Important: **Exams are not repeatable. When you sign up for this class, you are committing to come to the class for exams.**
- Final exam will be administered during the finals week (TBA)

Students will receive a letter grade based on a 100-pointscale. An A+ is not awarded as a final grade. Letter grades for the course will be assigned as follows:

Grade	Overall %
A	>90
A-	85<
B+	80<
B	70<
C	60<
F	below 60

Grades will not be rounded up. Therefore, if you receive a grade of 79.99, your grade will be B, not a B+.

No extra credit is allowed in this course.

Expectations:

Let the instructor know of your needs and constraints as early as possible **prior** to the assignment due dates.

Notify your instructor during the first week of the semester regarding course schedule conflicts due to military obligations and/or religious observances.

Any notifications beyond the first week of classes or after the exam/quiz due date has passed may not be approved and grade of zero will be entered.

LATE POLICY: PLEASE READ CAREFULLY!

- Students should make every effort to submit/complete assignments on time.
- *Any assignment that is not turned in on time, without prior arrangements with the instructor, will result in a zero grade for this assignment*
- Any arrangements to extend a deadline for an assignment must be made prior to the deadline.
- No extension will be granted after the deadline.
- Each student is allowed maximum of two (2) extensions per semester. Other requests may not be granted and grade of zero will be entered
- Any assignment/assessment that has not been completed by the end of the semester will receive a grade of zero.
- Note that there are no breaks/vacations in the online course.
- In the event of major holidays course will proceed as planned

Required Equipment –Since this is an online course and all assessments are complete through the computer, you need to have a computer with a reliable internet connection.

Technology Requirements: *It is a student's responsibility to ensure access to a reliable internet for quizzes, exams and lectures.*

- **Hardware:** You will need access to a Windows or Macintosh computer with at least 2GB of RAM and access to a fast and reliable broadband internet connection (e.g., cable, DSL). A larger screen is recommended for better visibility of course material. You will need speakers or headphones to hear recorded content and a headset with a microphone is recommended for the best experience. For the amount of Hard Disk Space required, when taking a distance education course, consider and allow for:
 1. the storage amount needed to install any additional software and
 2. space to store work that you will do for the course.

If you consider the purchase of a new computer, please go to [Patriot Tech](#) to see recommendations.

- **Software:** Many courses use Blackboard as the learning management system (LMS). You will need a browser and operating system that are listed compatible or certified with the Blackboard version available on the [myMason Portal](#). See [supported browsers and operating systems](#). Login to [myMason](#) to access your registered courses. Some courses may use other learning management systems. Check the syllabus or contact the instructor for details. Online courses typically use [Acrobat Reader](#), [Flash](#), [Java](#), and [Windows Media Player](#), [QuickTime](#) and/or [Real Media Player](#). Your computer should be capable of running current versions of those applications. Also, make sure your computer is protected from viruses by downloading the latest version of Symantec Endpoint/Anti-Virus software for free [here](#).
- Students owning Macs or Linux should be aware that some courses may use software that only runs on Windows. You can set up a mac computer with Boot Camp or virtualization software so Windows will also run on it. Watch [this video](#) about using Windows on a Mac. Computers running Linux can also be configured with virtualization software or configured to dual boot with Windows.

Note: If you are using an employer-provided computer or corporate office for class attendance, please verify with your systems administrators that you will be able to install the necessary applications and that system or corporate firewalls do not block access to any sites or media types.

Schedule Spring 2021 BIOL 566

Schedule may be subject to change! Please stay tuned for the announcements.

Week	Dates	Assignment
Week 1	January 25	Lecture 1
Week 2	February 1	Lecture 2 Weekly quiz
Week 3	February 8	Lecture 3 Weekly quiz
Week 4	February 15	Feb 15: Exam 1
Week 5	February 22	Lecture 4 Weekly quiz
Week 6	March 1	Lecture 5 and Lecture 6 Weekly quiz
Week 7	March 8	March 6th: Exam 2
Week 8	March 15	Lecture 7 Weekly quiz
Week 9	March 22	Lecture 8 Weekly quiz
Week 10	March 29	March 29: Exam 3
Week 11	April 5	Lecture 10 and Lecture 9 Weekly quiz
Week 12	April 12	Lecture 11 Weekly quiz
Week 13	April 19	Lecture 12 Weekly quiz
Week 14	April 26	Lecture 13 Weekly quiz
Week 15 Finals week	May 3 May 5	Final Exam (TBA)

Resources for Molecular biology: please utilize if you need a refresher

DNA replication, mitosis and meiosis, chromatin

<http://www.youtube.com/watch?v=teV62zrm2P0&feature=related>
<http://www.youtube.com/watch?v=4PKjF7OumYo&feature=related>
<http://www.youtube.com/watch?v=sJCWVTnFf5o&feature=related>
<http://www.youtube.com/watch?v=lf9rcqifx34&feature=related>
<http://www.youtube.com/watch?v=bwVjYxcDQ5I>

Transcription, processing, splicing, alternative splicing, transcription factors

<http://vcell.ndsu.edu/animations/transcription/movie-flash.htm>
<http://vcell.ndsu.edu/animations/mrnprocessing/movie-flash.htm>
<http://www.youtube.com/watch?v=4X8eK15R8yY&feature=related>
<http://www.youtube.com/watch?v=Dxyq8GAWbpo&feature=related>

Cells signaling and protein modification

<http://www.youtube.com/watch?v=U6uHotlXvPo>
<http://www.youtube.com/watch?v=NMeBZlBs2dU&feature=related>
<http://www.youtube.com/watch?v=tMMrTRnFdI4&feature=related>
http://www.youtube.com/watch?v=ZF2_ItzzVbs&feature=related
<http://www.youtube.com/watch?v=NB7YfAvez3o&feature=related>
<http://www.youtube.com/watch?v=iGb93jCKVXs&feature=related>
<http://www.dnatube.com/video/1594/Protein-Modification-Golgi>
http://www.youtube.com/watch?v=HpQLDBaHD_k&feature=related
<http://www.youtube.com/watch?v=SGBiy1HIWH8&feature=related>
<http://www.youtube.com/watch?v=NSvAfwMEo7o>
<http://www.youtube.com/watch?v=OtyhPEyLhvA&feature=related>

GMU Add/Drop Policy: As per GMU academic calendar.

RESOURCES

1. OFFICE OF DISABILITY SERVICES --- If you are a student with a disability and need academic accommodations, please see me and contact the Office of Disability Services (ODS) at (703) 993-2474. All academic accommodations must be arranged through the ODS. Refer to <http://ods.gmu.edu>
2. WRITING CENTER --- A114 Robinson Hall; (703) 993-1200;
<http://writingcenter.gmu.edu>
3. UNIVERSITY LIBRARIES --- "Ask a Librarian";
<http://library.gmu.edu/mudge/IM/IMRef.html>
4. COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS) --- (703) 993-2380;
<http://caps.gmu.edu>

5. UNIVERSITY POLICIES --- The University Catalog, <http://catalog.gmu.edu> , is the central resource for university policies affecting student, faculty, and staff conduct in university affairs.

Honor Code, Copyright, & Computing Policies: *To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code: **Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.***

Academic Integrity: Students are prohibited from distributing assignments, answers, quiz and exam questions on any medium to anyone. Media includes but is not limited to: texting, social media, websites

You are expected to adhere to all University policies and guidelines during your participation in this course. All work must be your own. Inappropriate use of the work of others is a George Mason University Honor Code violation. Please review the University's website for information on the following: Honor Code and Judicial Procedures; Copyright/Fair Use; and Responsible Use of Computing.

If you are a student with a disability and you need academic accommodations, please contact the Disability Resource Center (DRC) at 703.993.2474. All academic accommodations must be arranged through that office. Students must inform the instructor at the beginning of the semester, and the specific accommodation will be arranged through the Disability Resource Center.

Writing Center: Students who are in need of intensive help with grammar, structure or mechanics in their writing should make use of the services of the Writing Center, located in Robinson A116 (703-993-1200). The services of the Writing Center are available by appointment, online and, occasionally, on a walk-in basis.

University Libraries "Ask a Librarian" <http://library.gmu.edu/mudge/IM/IMRef.html>