1. Course description
We will cover changes in the prevalence of cancer and contemporary diagnostics and treatments. While these have dramatically decreased mortality, cancer continues to claim more than 585,000 lives annually. Therefore, the focus will be on the mechanisms that are corrupted in cancer cells and the differences in vulnerability among tissues, the technologies used to define pathways and lessons learned. Equally important are the strategies being used to exploit the vulnerabilities of tumors for personalized and targeted therapeutics. PREREQUISITES: Students are expected to have completed courses in Molecular and Cellular Biology (Animlsci200), Genetics (Animlsci311) or Graduate Student status.

2. Instructional goals:
We will use lectures to provide overarching concepts. Adaptive teaching using questions and PRS, if room accommodates this, to identify concepts that are understood as well as those that need to be reaffirmed. Online quizzes in Moodle will be used to support studying and identify the important concepts as well as alerting students that they should seek extra help from instructors. Collaborative learning will be encouraged for completion of out of class assignments. Exams will provide the

3. Textbook:
Primary research articles will be assigned as required readings. These will be provided electronically to students through MOODLE.

4. Evaluation and Grading:
The exams will be based on the topics reviewed in class and will assess students’ understanding of literature related to cancer biology as well as their ability to apply the experimental approaches to address critical questions.
- 5% Class participation
- 20% Quizzes and homework
- 25% Exam 1 --- Lectures 1-8
- 25% Exam 2 --- Lectures 9-15
- 25% Final Exam --- Comprehensive (lectures 1-25) for the course material. If the grade on the final exam is higher than a mid-semester hour exam, the lower grade will be dropped and the final will be 50% of the final grade.

4. Class schedule

<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Instructor</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tu</td>
<td>Joseph Jerry</td>
<td>Epidemiology of cancer</td>
</tr>
<tr>
<td>2</td>
<td>Th</td>
<td>Joseph Jerry</td>
<td>Molecular pathways 1 --- Experimental approaches</td>
</tr>
<tr>
<td>3</td>
<td>Tu</td>
<td>Joseph Jerry</td>
<td>Molecular pathways 2 --- Oncogenes vs tumor suppressor genes</td>
</tr>
<tr>
<td>4</td>
<td>Th</td>
<td>Joseph Jerry</td>
<td>Molecular pathways 3 --- Signaling</td>
</tr>
<tr>
<td>5</td>
<td>Tu</td>
<td>Joseph Jerry</td>
<td>Animal models --- testing molecular pathways</td>
</tr>
<tr>
<td>6</td>
<td>Th</td>
<td>Joseph Jerry</td>
<td>Mutations in human cancers --- COSMIC database</td>
</tr>
<tr>
<td>7</td>
<td>Tu</td>
<td>Joseph Jerry</td>
<td>Mutations in human cancers --- comparing tumor types</td>
</tr>
<tr>
<td>8</td>
<td>Th</td>
<td>Joseph Jerry</td>
<td>Mutations in human cancers --- TP53, PI3K</td>
</tr>
</tbody>
</table>

*No class, Monday schedule*
The epidemiology of cancers will be considered to provide the context and the factors that contribute to carcinogenesis. The course will provide an introduction to the mechanisms underlying carcinogenesis. This will include the experimental approaches and interpretations. The pathogenesis and mechanisms for hematological cancers and solid tumors will be considered in depth. This will provide a comparative approach to understand the differences in mechanisms and signaling. Differences in inherited predisposition to these tumor types will also emphasize the distinct pathways.

6. Academic honesty policy

Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. [See Appendix B for detailed examples of behavior that constitutes academic dishonesty.] Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. [See Appendix C for some suggested ways to deal with issues of academic integrity.] Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. The procedures outlined below are intended to provide an efficient and orderly process by which action may be taken if it appears that academic dishonesty has occurred and by which students may appeal such actions. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent.