PhD GUIDELINES
Cancer Biology Graduate Program
(Updated October 2025)

I. Goals of Graduate Training in Cancer Biology

The Cancer Biology Graduate Program at Wayne State University School of Medicine and the Barbara Ann Karmanos Cancer Institute is committed to providing an outstanding training experience in the rapidly evolving field of cancer research leading to the PhD in Cancer Biology. The guiding philosophy of our training program is to teach students to think critically, through an immersion in an educational curriculum that emphasizes hypothesis-based research in a multidisciplinary setting, training in effective communication, and exposure to cutting-edge technologies. The training program emphasizes clinical cancer care and translational research and provides extensive opportunities for oral presentation and scientific writing. Specialized training in fellowship writing, bioinformatics, metabolomics, etc., as relevant to the dissertation research, is encouraged. The prevailing goal of our training program is to develop scientists with strong foundational training and perspectives in Cancer Biology, and outstanding capacities for critical thinking, effective communication and networking skills needed for professional success in the coming decades. To complete the PhD in Cancer Biology, students must successfully defend their dissertation research and complete a publishable research project under the guidance of a faculty mentor.

Outside of the required coursework and written and oral comprehensive exams, the bulk of PhD study involves independent laboratory or population-based research leading to results of publishable caliber. The Cancer Biology Graduate Program offers a variety of research experiences in the broad field of Cancer Biology that range from basic laboratory research to translational research and population-based cancer research. Research opportunities are available in many contemporary areas of Cancer Biology including cancer therapeutics, metastasis, tumor microenvironment, breast cancer biology, carcinogenesis, cancer genetics and epigenetics, cancer epidemiology, and cancer immunology. Dissertation research mentors are selected based on students' research interests and the research rotation experiences (below). There are numerous ways students can become familiar with faculty research for identifying potential dissertation mentors, including web site summaries, faculty seminars, faculty meetings with incoming PhD students, and research rotations (see below). Each student must complete three laboratory research rotations during the first year of study, after which he/she chooses a dissertation mentor. Since scientific research is open-ended, the amount of time required for completion of a defensible dissertation leading to the PhD cannot be predicted, although typically the PhD degree in Cancer Biology is conferred within 4-5 years. A written dissertation and a final oral defense of the dissertation research to the Dissertation Committee are requirements for conferring the PhD degree in Cancer Biology. <u>There is a requirement for a minimum of one first author publication and one co-authored publication based on the dissertation research for the PhD degree in Cancer Biology.</u>

II. Roles of the Director, the Graduate Officer and Steering Committee

The Cancer Biology Director is charged with providing oversight of all aspects of the Cancer Biology Graduate Program and setting the overall priorities. The Graduate Officer in consultation with the Program Director will act as an academic advisor for the student until the dissertation advisor has been selected. The student should consult with the Graduate Officer before selecting courses.

Together with the Program Director and Graduate Officer, the Cancer Biology Graduate Program Steering Committee oversees student progress in the program. Approval by the Steering Committee will be required for the following:

- Acceptance of credit for prior off-campus academic activity
- Selection of rotation advisors
- Selection of dissertation advisor/mentor
- Plan of Work
- Doctoral Committee composition

In addition, the Steering Committee regularly monitors the academic and research progress of students in the doctoral program. Major milestones include the written comprehensive exam (year 1) and the oral comprehensive exam (May-June, year 2). In May of the 3rd year of PhD study, students are expected to provide a summary of progress toward the dissertation goals for Steering Committee review. The Steering Committee decides final operational changes relating to curriculum, admissions, etc., based on recommendations of the appropriate subcommittee (e.g., Curriculum, Admissions). Finally, the Steering Committee of the Cancer Biology Graduate Program serves as the advisory committee for the T32 CA009531 Training Grant in the Biology of Cancer.

III. Financial Support

All students accepted into the Cancer Biology PhD program are provided financial assistance. Students receiving assistantships are permitted to take no more than ten credits for the Fall and Winter semesters and no more than one credit hour per Spring/Summer semester. Financial support for our PhD training program in Cancer Biology is derived from university graduate research assistantships and fellowships, NIH training grants (e.g., T32 CA009531), faculty grants, and individual graduate fellowships. Assistance with the development and submission of individual F30/F31 graduate fellowships is provided through the Cancer Biology Graduate Program. All domestic PhD and MD/PhD students are expected to submit a F30/F31 fellowship during year 3 of PhD study.

Students are covered by a health insurance policy that is partially paid by Wayne State University. Spouses and children of students are also eligible for coverage. The health insurance policy provides coverage for hospital, surgical, consultant and incidental fees.

Funding from various sources is available to attend and present research findings at national/international scientific conferences, and to attend scientific workshops (see below).

IV. Curriculum

All students in the Cancer Biology Graduate Program will enroll in the standardized Cancer Biology core curriculum as summarized below. Course descriptions are provided in Section XVII below.

Core Curriculum

CB7130 Clinical Aspects of Cancer Biology	1 credit
CB7210 Fundamentals of Cancer Biology	4 credits
CB7220 Molecular Biology of Cancer Development	4 credits
CB7240 Molecular Mechanisms of Cancer and Therapy	4 credits
CB7300 Special Topics in Cancer Biology	1-8 credits
CB7430 Cancer Epidemiology	2 credits

CB7600 Applied Cancer Biostatistics	2 credits
CB7700 Recent Developments in Cancer Biology (Journal Club)	4 credits
CB7710 Individual Study in Cancer Biology (Research Rotations)	3 credits
CB7800 Rigor and Reproducibility in Cancer Biology	1 credit
CB7890 Seminar Series	4 credits
CB8910 Applied Cancer Bioinformatics	1 credit
CB8920 Principles of Translational and Clinical Cancer Research	1 credit

A total of 42 coursework credits are required and should be completed by the 2nd year of PhD study. For MD/PhD students, up to 20 credit hours will be transferred from the medical school curriculum. In addition, MD/PhD students will be expected to enroll in 2 of the 3 Cancer Biology Core Curriculum Courses (CB7210, CB7220 and/or CB7240) for a total of 8 credit hours and will select from two CB7300 Special Topics courses.

All Cancer Biology PhD students are required to attend and participate in the student Journal Club (CB7700) during the Fall and Winter semester through the end of year four. Participation in the Cancer Biology Seminar (CB7890) is expected for the duration of the trainee's PhD study. During years 1 and 2, these courses will be taken for 1 credit hour each; during years 3 and 4, students are required to register for zero credit. The zero credit hour registration will be included on the transcripts and a grade will be assigned and will appear on the student's transcript.

Attendance at PhD student defenses in Cancer Biology is also mandatory.

During the second year of PhD study, students must submit a "Plan of Work" that documents the academic curriculum leading to the PhD. A written comprehensive qualifying exam is administered in the late spring of the first year of study, based loosely on an individual F30/F31 predoctoral fellowship application. This is followed during the second year by an oral comprehensive exam of the proposed dissertation research based on a written research prospectus. PhD candidacy is conferred upon successful completion of the oral comprehensive exam. During the summer of the first year of study, a month-long clinical rotation is required (CB 7130) during which graduate students "round" with oncologists treating cancer patients in the Karmanos Cancer Hospital. First year PhD students are also required to read the book "The Emperor of All Maladies: A Biography of Cancer" by Siddhartha Mukherjee during the summer of the first year of PhD study. The third and subsequent years are devoted to dissertation research. Students can select up to 7 - 8 credit hours of general research, and 18 dissertation research credits during consecutive semesters (see below) to complete the Graduate School requirements for the PhD degree. Further details are provided below.

Dissertation Research

CB7996 Research	1- 8 credits
CB9991 Doctoral Candidate Status 1	9 credits
CB9992 Doctoral Candidate Status 2	9 credits

Conferring of the Doctor of Philosophy degree in Cancer Biology requires at least sixty credits.

In addition to traditional classroom learning, there are many additional educational opportunities available to Cancer Biology students including monthly research seminars by nationally/internationally renowned scientists both within and outside the cancer center, special non-credit courses, fellowship and grant writing, and research workshops.

V. Research Rotations

A. Definition

Research rotations (CB 7710) are research projects carried out by first-year students under the supervision of a full-time Cancer Biology graduate faculty member. A rotation has defined objectives that can be accomplished within the allocated time span.

B. Objectives

Research rotations are expected to achieve two major objectives:

-The student will gain valuable training and experience in laboratory or population science research techniques and approaches.
-The student will be provided an experience by which to choose a specific faculty member to direct her/his doctoral dissertation research.

The value of productive research rotations cannot be over emphasized since optimal pairing between students and mentors is essential to successful PhD study.

C. Number and Duration of Rotations

All graduate students in Cancer Biology will complete three rotations within the first year of the graduate program. Each rotation will consist of no less than 8 weeks per rotation. Typically, this includes 2 rotations in the fall semester, followed by one 8-week rotation in the winter semester. The student is expected to spend a minimum of 15-20 hours per week performing research during the rotations. Students who choose to enter the program in the summer term prior to matriculation have an opportunity to complete a 10-week research rotation before classes begin. During the summer term, the student is expected to expend full time (~40 hours per week) effort on the rotation project.

D. Selection of Rotation Advisor

During the week prior to the beginning of the fall semester, a “Meet the PI” event will take place for incoming students to meet faculty members interesting in hosting rotating PhD students. At this time, students will also be introduced to the rotation expectations and a list of potential rotation mentors will be provided. Following the initial group meeting, students are expected to meet “one-on-one” with potential rotation mentors during the first two weeks of the fall semester. By the end of the 2nd week of the fall semester, students should identify their mentor for the first research rotation for the fall semester.

During the fall semester, students should take the opportunity to meet with additional faculty members who might serve as rotation mentors for the 2nd (fall) and 3rd (winter) rotations.

All rotations must be approved by the Cancer Biology Program Director in consultation with the Steering Committee.

E. Final Report

At the end of the rotation (within two weeks of completion), rotation mentors should prepare a written evaluation the student’s progress (see “Rotation Appraisal” on the Cancer Biology web page under “Resources”) and meet with the rotating student. This document should be submitted to the Cancer Biology Graduate Program Office. The final report should be signed by both the rotation mentor and student. The purpose of the appraisal and final report is to provide the Steering Committee a means of monitoring student progress during the laboratory rotations.

F. Academic Credit

The student will register for one credit of CB7710 (Individual Studies) for each rotation. The faculty advisor will be responsible for assigning a satisfactory/unsatisfactory grade associated with the rotation.

VI. Seminars and Conferences

There are a multitude of cancer-related seminars throughout the university and cancer center. The Karmanos Cancer Institute Cancer Research Seminar Series offers a monthly seminar by nationally/internationally recognized leaders in Cancer Biology. In connection with these seminars, students are expected to meet outside speakers. At least one student-hosted seminar is planned each academic year. Seminars are considered an integral part of the educational experience leading to the PhD degree, so attendance is expected. Seminars are advertised by email.

In addition to formal seminars by outside speakers, monthly cancer-related seminars by internal (Wayne State/Karmanos) faculty are presented. Students are also provided special training opportunities ranging from career guidance to research workshops. Students will be notified electronically of these opportunities.

Students are expected to attend and present their research at national and international conferences. The Cancer Biology Graduate Program provides matching support for attendance at one conference each year with the expectation that the student will be presenting his/her research. Additional travel support for students is provided by the Graduate School. Consideration for support from the Cancer Biology Program for travel is dependent upon attendance of at least 80% of Karmanos Cancer Institute Research Seminars.

An annual Cancer Biology Graduate Research Symposium organized by the Cancer Biology graduate students is held in the winter/spring of each year at which students have opportunities to present their research in posters and oral presentations. Participation in the research symposium is mandatory for all Cancer Biology students beginning with their 1st year of PhD study. Highlights of the annual symposium include a keynote address by a distinguished alumnus of the Cancer Biology Program and announcement of the recipient of the “Leonard N. Simons Award for Exemplary Research and Scholarly Achievement” to a Cancer Biology PhD student who has distinguished him/herself through scholarship and leadership among his/her student peers. In 2023, the Cancer Biology Program introduced the “Mary Lou Zieve Award for Professional Development” to provide a senior Cancer Biology student support for specialized training that would directly impact his/her research.

VII. Academic Requirements

All students are required to maintain at least an earned "B" grade point average (3.0 GPA) in the Cancer Biology graduate curriculum. If a student's GPA falls below 3.0, that student cannot be supported by a Graduate Assistantship and is placed on “academic probation” for the next semester. Failure to raise the GPA to the minimum 3.0 level will be the grounds for dismissal from the Cancer Biology Graduate Program. A grade lower than "B" in any of the core curriculum courses will also be grounds for dismissal from the program.

Academic work submitted by a graduate student for graduate credit is assumed to be of her/his own creation, and, if found not to be, will constitute a violation of the Student Code of Conduct and may subject you to charges of academic misconduct” including “cause for

dismissal from the School." Since our goal is to facilitate developing critical thinking skills, ideas, and perspectives, the use of any artificial intelligence (AI) content creation tool/system (e.g., Jasper, ChatGPT, Bard, etc.) is not permitted. In short, there is zero tolerance for the use of AI in scholarly pursuits related to the Cancer Biology Program.

VIII. Written Comprehensive Examination

A written comprehensive examination will be administered at the end of the winter semester of the first year of the program. This examination involves development of a F30/F31 type research proposal based on research papers submitted by Cancer Biology faculty members. Examinations are graded by up to 3 Cancer Biology faculty members who are expected to meet with the student to discuss the proposals and how they could be improved. Passage requires sign-off by all three faculty reviewers.

IX. Selection of Dissertation Advisor

The Cancer Biology Program offers dissertation research opportunities in many areas of Cancer Biology, spanning from basic research to translational research and population-based research. At the end of the first year of PhD study, the student will choose a dissertation research project and a dissertation mentor. **Final approval of the dissertation mentor will be by the Cancer Biology Steering Committee.**

Upon committing to a particular mentor, realistic goals should be set by the student and mentor for performing a research project that can be completed within 3-4 years. A Mentor/Student Agreement must be signed by mentor and student and returned to the Cancer Biology Program office. Copies of the Mentor/Student Agreement can be found on the Cancer Biology web site.

X. Plan of Work

Doctoral students at Wayne State University must complete the University's "Plan of Work" form before 45 credit hours of research have accrued. This document should be prepared with the assistance of the Graduate Officer and the PhD Dissertation Advisor. An example of a Plan of Work is under "Resources" on the Cancer Biology Graduate Program web site. The Plan of Work requires the signed approval of the student's Dissertation Advisor and the Cancer Biology Graduate Program Graduate Officer.

XI. Selection of a Doctoral Committee

During the first semester after approval of the Dissertation Advisor, the student, together with the Dissertation Advisor, should select a Doctoral Committee. The committee must consist of at least four members of the Graduate Faculty. The committee members must include the student's Advisor and at least two other members of the Cancer Biology faculty (with primary, joint or secondary appointments in the Department of Oncology), and one member with a primary appointment in a department other than Oncology. For CB faculty advisors with Graduate Faculty status in a department other than Oncology, a Doctoral Committee co-chair with a Graduate Faculty appointment in Cancer Biology/Oncology must be appointed. **The Doctoral Committee must be approved by the Cancer Biology Graduate Program Steering Committee. The Steering**

Committee reserves the right to require faculty additions to the Doctoral Committee.

The purpose of the Doctoral Committee is to guide the student's progress. The Doctoral Committee is also charged with administering both the oral examination required to progress to PhD candidacy (see below), as well as the Doctoral Dissertation Defense.

Additions or deletions from the original Doctoral Committee must be approved by the Steering Committee and the Graduate School. The student must meet with his/her Doctoral Committee at least twice each year. The student will be responsible for organizing the committee meetings. A Committee Report Form (this form can be found on the web site under "Resources") must be completed summarizing the recommendations of the Dissertation Committee, signed by all committee members and submitted to the Cancer Biology Graduate Program office within one week following the committee meeting.

XII. Individual Development Plans

All Wayne State graduate students are required to prepare Individual Development Plans (IDPs). This requirement stems in part from NIH mandates and is designed to provide students with a concrete mechanism by which to examine and plan career choices and to monitor progression toward these goals during their graduate training. IDPs should be prepared by students during fall of the first year upon consultation with the Graduate Officer, Program Director and their dissertation mentors. They are to be submitted to the Graduate School and must be updated annually. Further information, including worksheet, template, and submission forms, can be found at the following web site: http://gradschool.wayne.edu/policies/idp.php. A copy of the IDP should be provided to the Cancer Biology Graduate Program office.

XIII. Oral Qualifying Examination and Dissertation Proposal

After successful completion of the written comprehensive examination, the student will prepare a written "Dissertation Prospectus" outlining the proposed dissertation research (typically during winter of year 2 for PhD students). The outline should be organized similar to the Research Plan of a F31 fellowship application to the National Institutes of Health. The research proposal forms the basis of the oral qualifying examination. Students are expected to develop their research proposals into individual predoctoral fellowships for submission to the Department of Defense, National Science Foundation, and/or NIH. Fellowship applications are expected to be submitted during year 3 of PhD study.

The Doctoral Committee will administer the oral examination. Oral examinations are generally administered between January and June during the second year of PhD study. Satisfactory performance will be determined by having no more than one dissenting vote on passing. In the event of a failure, the Committee may recommend to the Graduate Program Steering Committee and the Office of Graduate Studies either (i) that a second examination be taken within 12 months (but no sooner than one academic semester after the first examination), or (ii) dismissal of the student from the program. After successful completion of the oral qualifying examination and incorporation of any modifications requested by the Doctoral Committee, a copy of the written research proposal (along with a summary as indicated on the Graduate School Dissertation Outline Form) will be submitted to the Graduate School for approval.

XIV. Steps to Achievement of Doctoral Candidacy

The student achieves PhD Candidacy status after completing the following requirements:

A. Satisfactory completion of two years of study in the Cancer Biology Graduate Program, and completion of the core curriculum.
B. Satisfactory completion of the written comprehensive examination.
C. Filing and approval of the Plan of Work with the Graduate School.
D. Passing of the oral qualifying examination.
E. Filing and approval of the Research Prospectus, and Candidacy forms with the Graduate School.

Students are expected to achieve Doctoral candidacy by June of their second year in the program and no later than the end of the summer semester of their second year.

XV. Progress Toward the PhD Degree

By June 1 of the third academic year of PhD study, all Cancer Biology students are expected to provide (a) a one-page summary that includes the research progress toward each of their specific aims from the prospectus and (b) a copy of their CV. These documents will be reviewed by the Cancer Biology Graduate Program Steering Committee to evaluate progress toward the PhD. If progress toward the PhD is considered inadequate, the student will meet with the Cancer Biology Program Director and/or the Cancer Biology Steering Committee. Inadequate progress toward the PhD is grounds for redirection toward a Masters degree track and/or dismissal from the Cancer Biology PhD program.

XVI. Steps to Completion and Awarding of PhD Degree

Students have a seven-year time limit to complete all requirements for the PhD degree. Upon completion of the doctoral research, there are specific steps that must be taken to graduate with the PhD degree in Cancer Biology.

A. Student prepares dissertation.
B. Student files “Application for Degree” no later than the last day of registration for the term in which he/she expects to graduate.
C. Students planning to defend their PhDs must first solicit approval from the Cancer Biology Steering Committee and the Program Director to defend their PhD prior to soliciting approval from the PhD Dissertation Committee. At least two weeks prior to the date of the upcoming final dissertation committee meeting, a ~1 page summary which outlines the student’s research accomplishments in relation to each of the proposed aims, a summary of publications, awards, etc. on which awarding the PhD will be based should be submitted to the Cancer Biology Program office. This report should be accompanied by an “Application to Defend the PhD in Cancer Biology” form from the Cancer Biology website. The Cancer Biology Graduate Program Steering Committee will review, approve or disapprove the progress report, and advise the Cancer Biology Program Director of the decision.
D. Upon approval from Cancer Biology Program Director, the student meets with the Doctoral Committee and receives Committee approval for the dissertation defense.

E. The student submits the dissertation to the Graduate School for approval of dissertation format.
F. Student arranges date/time/place of the final oral defense and informs the Graduate School two weeks in advance. Advertising the PhD defense is coordinated with the Cancer Biology Graduate Program office.
G. The student completes Final Report document. The Final Report document must be signed by all PhD Dissertation Committee members, the Cancer Biology Graduate Director, and the Graduate Officer indicating that the dissertation has passed the plagiarism check.
H. The student uploads the document to the ETD web site and submits to the Graduate School the signed Final Report document with a copy of the defense flyer at least 2 weeks prior to the date of defense.
I. A public lecture is announced and advertised, after which the student presents a public lecture and participates in a closed-door defense of the dissertation with the Doctoral Committee.
J. The Final Report form and the Graduate Examiner's Report form with all signatures and marks are returned to the Graduate School within 48 hours of the defense. To communicate to the Graduate School that revisions to the dissertation were requested at the defense, the box on the defense form indicating that "Revisions to Dissertation Required" should be marked.
K. Once the dissertation corrections have been completed to the satisfaction of the Dissertation Committee, committee members should sign the front page of the dissertation indicating that the student has made the revisions satisfactorily. The student should upload the final document with the signed front page by the deadline date for the semester in which he/she wishes to graduate.

In addition to the dissertation requirement, all students receiving a PhD in Cancer Biology are expected to publish a minimum of 2 research publications (exclusive of review articles) in ISI indexed journals (i.e., cited on PubMed), at least one for which the student is first author.

XVII. Cancer Biology Course Descriptions

***CB7130 - Clinical Aspects of Cancer Biology (1 Credit)*:** Cancer Biology PhD students accompany clinicians during rounds in hospital and outpatient clinics, as well as attend clinical conferences and related sessions.

***CB7210 - Fundamentals of Cancer Biology (4 credits)*:** This course focuses on fundamental principles underlying the complex field of contemporary cancer biology. The lectures are organized into two thematic blocks: I, mechanisms of cancer development and progression, and II, characteristics of cancer types and approaches to cancer therapy.

CB7220 - Molecular Biology of Cancer Development (4 credits): The course will provide a basic understanding of the molecular biology of cancer with emphasis on core concepts and molecular technologies. The course will include lectures, student-led discussions, and critical reading of literature. Students are required to present and actively participate in discussions.

CB7240 - Molecular Mechanisms of Cancer and Therapy (4 Credits): This course will introduce graduate students to the biology of solid tumors and hematological malignancies, and the principles of conventional chemotherapy, targeted therapy, radiation therapy, and immunotherapy. The lectures cover cancer-related signaling pathways, tumor immunology, tumor microenvironment, cancer

metastasis, tumor imaging, mechanisms of drug action, pharmacokinetics and clinical implementation.

CB7300 - Special Topics in Cancer Biology (1 - 3 Credits): This course is designed to provide students exposure to emerging themes and technologies in the cancer field as well as to cancer-related topics that are not covered in detail in other courses. Special Topics courses may be team-taught or taught by individual faculty and will be offered as a minicourse or full course. This course will be offered in the fall and winter semesters. **Prerequisite: CB7210**.

CB7430 - Cancer Epidemiology (2 credits): This course will serve to introduce students to the general concepts and methods used in cancer epidemiology research. The course is intended to educate students on important measures of cancer burden in the United States and worldwide, as well as the major causes of human cancer. As part of the course curriculum, students will be required to review and provide critical appraisal of selected literature in innovative areas of cancer epidemiology research. **Prerequisites: None. However, FPH 7240 "Introduction to Epidemiology" is strongly recommended by the instructor.** This course is offered in the fall semester.

CB7600 - Applied Cancer Biostatistics (2 Credits)**:** Students are introduced to the concepts and applications of statistical methods and data analysis. Students will receive hands-on experience in statistical thinking, analyzing, and interpreting through the interactive teaching modules. The course provides an opportunity for students to understand statistical analyses in the Cancer Biology literature, as well as provide guidance for planning and analyzing their own research studies. This course is offered in the winter semester.

CB7700 - Recent Developments in Cancer Biology (1 credit)**:** This course is organized in a journal club format and is designed to develop proficiency in critically evaluating original scientific literature, to develop oral and written communication skills, to broaden knowledge of current cancer research, and to provide insight into different research strategies. Each student is expected to participate in class discussions. This course is restricted to students in the Cancer Biology Graduate Program. It is offered each year during the fall and winter semesters and is **mandatory for students in years 1-4.**

CB7710 - Individual Studies in Cancer Biology (3 credits) Cancer Biology graduate students pursue experimental research under the guidance of selected faculty. This is the research rotation through which first year students select their PhD dissertation mentor.

CB7800 - Rigor and Reproducibility in Cancer Biology (1 Credit): The objective of this course is to provide students with the ability to understand and learn how to conduct rigorous and reproducible cancer research. These include experimental design, data interpretation, publishing, animal and human research, scientific misconduct, artificial intelligence, and other topics relevant to the conduct of responsible research in Cancer Biology.

CB7890 - Seminars in Cancer Biology (1 Credit)**:** This course provides Cancer Biology students with the opportunities to present their dissertation research to their peers. This class not only provides the students with the opportunity to develop their oral presenting skills, but also gives the students a chance to critically evaluate their peers. **This course is mandatory for all students in all years in the Cancer Biology program** and is offered every fall and winter semester.

CB8910 - Applied Cancer Bioinformatics (1 Credit): This course is designed to instruct students who have a general background in molecular biology in the understanding and practical application of contemporary “omics” technologies within the context of cancer research. The course will emphasize

the use of publicly available cancer “omics” datasets and associated bioinformatics tools for data mining. Students will develop skills by utilizing data repositories and analysis methods in a project geared toward their research interests. No coding or programming experience is required. This course is offered in the fall semester.

***CB8920 - Principles Translational and Clinical Cancer Research (1 credit)*:** This course is designed to complement the mandatory clinical rotations of all Cancer Biology PhD students. The goal of this course is to introduce students to the fundamentals of translational and clinical cancer research with an emphasis on identifying clinically meaningful research goals and application of laboratory-based research into clinical trials. Students will attend lectures from clinical oncology faculty members. Students will work with clinical mentors to develop translational research projects and/or correlative end points for a clinical trial concept. Students are expected to present a brief proposal of the project at the end of the course, which will be evaluated by the course director.