



UNIVERSITY *of*  
**ROCHESTER**  
MEDICAL CENTER

**SCHOOL OF MEDICINE AND DENTISTRY**

**GRADUATE STUDIES HANDBOOK**

**for the Ph.D. DEGREE PROGRAM**

**in GENETICS**

**AND**

**THE GENETICS, DEVELOPMENT, AND STEM CELL PROGRAM**



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## 1.0 FIRST YEAR REQUIREMENTS FOR STUDENTS IN GENETICS, DEVELOPMENT, AND STEM CELL PROGRAM (GDSC)

### 1.1 Preface

The GENETICS, DEVELOPMENT, AND STEM CELL PROGRAM (GDSC) Program is primarily responsible for education and counseling in the first year of graduate studies, with some continuing responsibilities for graduate student education in subsequent years. During this initial year students fulfill core course requirements and perform laboratory rotations. Following the first year of study, students enter the degree-granting program of choice. Students in the GDSC program may enter any of the following Ph.D. degree-granting programs: Biochemistry, Molecular and Cell Biology; Biological Engineering; Biophysics, & Structural Biology; Cardiovascular Science; Cellular & Molecular Basis of Medicine; Neuroscience; Pathways of Human Disease and Toxicology.

Basic information about the first year of study is found on the following pages. Information concerning each degree-granting program at the University of Rochester is summarized in the Graduate Bulletin, which is updated every two years. Both students and advisors will need to consult these sources. Policy, of course, continues to evolve in response to the changing needs of the graduate programs and the students in them. Thus, it is wise to verify any crucial decisions with the Graduate Studies Coordinator.

### 1.2 Courses Required in the First Year of Study:

A total of 96 credit hours are required for the Ph.D. This number reflects credit hours obtained for course work, attendance and participation in topical seminars, and credit hours awarded for satisfactory research work relating to the thesis project. Program course requirements are meant to be sufficiently flexible to accommodate students with diverse backgrounds and career goals. Students should consult with the Program Director for curriculum advice. Certain courses or their equivalent constitute a Core Curriculum for the GDSC Program and are specifically required in the first year:

#### Fall Semester (16 Credits)

<u>Course Number</u>	<u>Title</u>
IND 408 (5 Credits)	Advanced Biochemistry
IND 409 (4 Credits)	Cell Biology
IND 501 (1 Credit)	Ethics & Professional Integrity
GEN 503 (1 Credit)	Genetics Seminar*
GEN 595 (6 Credits)	Ph.D. Research Rotation

#### Spring Semester (16 Credits)

<u>Course number</u>	<u>Title</u>
IND 410 (4 Credits)	Molecular Biology & Genetics
GEN 504 (1 Credit)	Genetics Seminar Series*
GEN 595 (7 Credits)	Ph.D. Research Rotation
GEN 507 (4 Credits)	Advanced Genetics & Genomics

\* Required each semester throughout the course of study

\*\* The number of credits given for GEN 595 varies depending on if an elective is taken and how many credits is given for the elective. A total of 16 credits in the fall and spring semesters must be maintained.

#### 1.2.1 Electives

**Degree programs generally require additional courses. Please consult individual degree-program handbooks for curriculum requirements.**

Program students may choose take the one of two required electives in the first Spring semester. Elective courses selected by the student should reflect the specific interests of the individual student and the requirements for

specific degree-granting program that the student is interested in. A wide variety of courses are available for consideration and the student is instructed to consult the appropriate degree-granting program handbook for a listing of additional required as well as approved elective courses. It should be noted that course offerings change constantly and the student should consult <https://cdcs.ur.rochester.edu/>

For a listing of approved electives for the Ph.D. in Genetics Program see section 2.2.2 of this handbook and consult the Program Director.

### 1.2.2 Genetics Seminar Series Requirement

All students will register for the Department of Biomedical Genetics student seminar series: Gen 503 (Fall)/504 (Spring). Credit will be awarded for attendance at a minimum of 60% of the seminars in each semester. If a student fails to attend 60% of the student seminars in a given semester, he/she will be given an “I” (incomplete) for the course. In the following semester, the student must attend the number of seminars missed in the previous semester in addition to the 60% requirement. If the requirement is not met in the following semester an IE grade will be recorded on the student’s permanent record.

### 1.2.3 Student Rotations (GEN 595)

All first year students are required to complete three laboratory rotations during the first year. At the beginning of the academic year, faculty members will present short (15 minute) informal lectures to the incoming students describing their research activities. The goals of this series are to acquaint students with ongoing research in the program and to alert them to opportunities for their laboratory rotations and future Ph.D. research. **Attendance at these lectures is critical for selection of laboratory rotations.**

Students sign up for laboratory rotations by submitting a list of their choices to the GDSC Program Director. Every effort will be made to accommodate the students’ wishes. Students are expected to complete 3 projects in 3 different laboratories representing more than one area of interest before requesting assignment to a laboratory in which their Ph.D. research project will be completed. If advisable, a student will complete an additional rotation before requesting assignment.

Laboratory rotations are as follows:

Rotation #1: October 1 – December 15

Rotation #2: January 1 – March 15

Rotation #3: March 16 – May 31

SUMMER Rotation: July 1 – August 31

At the end of each rotation period, [students](#) and [faculty](#) are required to complete a rotation evaluation. **A copy of the evaluation will be kept on file and the original will be emailed to the Office of Graduate Education.** This will also be used to fulfill the progress report in the first year.

## 2.0 Ph.D. IN GENETICS PROGRAM REQUIREMENTS

### 2.1 Preface

This Handbook summarizes the major features and policies of the program leading to the Ph.D. in Genetics. Students may enter this program through any of the Graduate Education in Biomedical Sciences programs. Since many of our students will enter the Ph.D. programs from the GDSC program, information for the first year requirements for that program are also included in this handbook to provide a single volume reference for the student. The general features of the graduate experience at the University of Rochester are summarized in the Graduate Bulletin, which is updated every two years. Both students and advisors will need to consult both sources, though it is our intent to provide the salient features here. Policy, of course, continues to evolve in response to the changing needs of the graduate programs and the students in them. Thus, it is wise to verify any crucial decisions with the Graduate Education Coordinator.

Although the Ph.D. in Genetics is primarily a research degree, it also represents a certain breadth of training in areas that are not directly related to the thesis research project. This is best attained by taking formal courses, attending and participating in various seminar programs, teaching assistantship, and research activities (including publication).

The Ph.D. Program in Genetics is an interdepartmental degree program administered through the Department of Biomedical Genetics in the School of Medicine and Dentistry. Dr. Land is currently Graduate Studies Director for the Program in Genetics. Students who have completed an undergraduate degree in science and at least one undergraduate course in genetics (i.e. Biology 121 – Genetics or its equivalent) may enter the laboratory of any faculty with approval of the Graduate Studies Director.

Upon acceptance, the student will follow the general requirements set forth below. In addition, the student will be subject to the requirements of the advisor's sponsoring department.

### 2.2 Courses

A total of 96 credit hours are required for the Ph.D. Of these, a minimum of 24 credit hours of course work and 6 credit hours of topical seminars (i.e. GEN 503/504) are required, with the remaining credit hours awarded for satisfactory research work relating to the thesis project. Program course requirements are meant to be sufficiently flexible to accommodate students with diverse backgrounds and career goals. Students should consult with their advisor or the Graduate Studies Director for curriculum advice (students in their first year of studies are advised by the GDSC Program Director). Certain courses or their equivalent are specifically required. Course descriptions may be found at: <https://cdcs.ur.rochester.edu/>

#### 2.2.1 Courses required in the first two years of study:

<u>Course Number</u>	<u>Title</u>	<u>Season</u>
IND 408 (5 Credits)	Advanced Biochemistry	Fall
IND 409 (4 Credits)	Cell Biology	Fall
IND 501 (1 Credit)	Ethics & Professional Integrity	Fall
IND 410 (4 Credits)	Molecular Biology & Genetics	Spring
GEN 507 (4 Credits)	Advanced Genetics & Genomics	Spring
GEN 503 (1 Credit)	Genetics Seminar	Fall*
GEN 504 (1 Credit)	Genetics Seminar	Spring*
GEN 595 (1-6 Credits)	Ph.D. Research Rotation or Ph.D. Research	Fall/Spring* (1 <sup>st</sup> year)
2 Electives (1-6 credits)		

\* Required each semester throughout the course of study and includes yearly presentations beginning at the end of year 2

## 2.2.2 Approved Electives

### Fall Semester

<u>Course Number</u>	<u>Title</u>
BIO 426 (4 Credits)	Developmental Biology
BPH 509 (5 Credits)	Molecular Biophysics (alt years)
MBI 473 (3 Credits)	Immunology
GEN 508 (4 Credits)	Systems Biology (alt years-even)
GEN 506 (4 Credits)	Stem Cell Biology (alt years-odd)

### Spring Semester

<u>Course Number</u>	<u>Title</u>
BST 467 (3 Credits)	Applied Statistics in the Biomedical Sciences
IND 407 (4 Credits)	Structure and Function of Cell Organelles
IND 411 (5 Credits)	Methods in Structural Biology
IND 443 (4 Credits)	Eukaryotic Gene Organization & Expression I
IND 447 (4 Credits)	Signal Transduction
IND 419 (3 Credits)	Intro to Quantitative Biology
MBI 421 (3 Credits)	Microbial Genetics
MBI 456 (4 Credits)	General Virology (alt years)
BCH 412 (5 Credits)	Advanced Topics in Biological Macromolecules
PTH 507 (3 Credits)	Cancer Biology

## 2.2.3 Exemptions from Course Work Requirements

All entering students concerned with exemptions from core courses may appeal to the Program Steering Committee to determine whether an exemption is appropriate. The student may be asked to meet with the Course Director to determine whether or not the exemption is warranted.

## 2.3 Additional Requirements - Second Year

### 2.3.1 Choosing a Research Advisor

After completing three research rotations (ideally by June 1st), students may submit their choices for thesis advisor to the Department Office. Every attempt will be made to place the students in their first-choice laboratory, but limitations of space and funding may, in very rare cases, make it necessary to assign a student to his/her second choice. If a student does not feel prepared to choose a thesis advisor at this time, he/she may elect to do an additional rotation in the summer after the first year.

In the unusual situation where a student wishes to select a thesis advisor who is not a member of the GDSC Program, the student has two options. First, the student may request to join the program/degree program of the intended thesis advisor. That program must approve the request of the student. The second option is that the student remains in the GDSC Program degree program with a GDSC faculty member as a co-advisor. The co-advisor must have sufficient knowledge in the proposed area of research to provide substantive advice and guidance to the student.

The first option of changing to the program/degree program of the advisor is encouraged. It is considered in the best interest of the student. The second option of remaining in the GDSC program with a co-advisor will be considered and approved by the Program Director in unusual circumstances.

Once the advisor is selected the student will then follow the curriculum, procedures, rules and regulations of their chosen Ph.D. program.

### 2.3.2 Choosing a Thesis Advisory Committee

Choose a Thesis Advisory committee at the beginning of the second year (see section 4.0).

### 2.3.3 Presenting the First Student Seminar

Experience in organizing research data, interpretation of data, synthesis of information from diverse sources, and presentation to an audience of scientific colleagues represents valuable preparation for a career in science, whether in an academic or industrial setting. Therefore, students will be required to present a yearly seminar in the Genetics Seminar series beginning in their second year of studies

### 2.3.4 Qualifying Exam

At the beginning of their 5<sup>th</sup> semester (By OCTOBER 1), complete the Qualifying Exam (see Section 3.0 for more details). **Paperwork for the Qualifying Exam must be provided to the coordinator's office at least 15 working days prior to the examination date. To prepare for this deadline, meet with the Graduate Studies Coordinator.** Students must have completed a minimum of 30 credit hours of course work at the time of the Qualifying Exam, of which no more than 6 may be credits of research.

## 2.4 Additional Program Requirements – Third and Succeeding Years.

**Teaching Assistantship:** Each student will be required to act as a teaching assistant in IND 409 for one semester. Usually, this will be during the third year. However, for those students for whom English is a second language, the teaching assistantship can be delayed until the fourth year.

- Ph.D. research and thesis preparation.
- Yearly student seminar presentation.
- 6 seminar and/or poster presentations are required during the course of studies.

Presentation at the student Seminar Series or in another approved seminar course will fulfill this requirement. Presentation at a University poster day and presentations made at national meetings may also be used to fulfill the requirement. **An abstract or outline of each presentation is required for the file in the Department Office.**

### 3.0 QUALIFYING EXAMINATION PREPARATION AND REGISTRATION

The purpose of the Qualifying Examination is to determine whether the student is qualified and competent to continue work toward a Ph.D. in Genetics. It is not intended as a test of the proposed research problem or of the supporting experimental data, but rather as a means of determining the potential of the student for independent thought, his or her comprehension of the general field and capacity for exploiting a relevant problem in a scientifically sound manner.

For students in the Genetics Program, the procedure involves preparation by the student of a written Ph.D. thesis research proposal. Because a career in science will undoubtedly involve submission and defense of research projects (whether in an academic or industrial setting) we recommend using a modified NIH proposal outline as described below. **The Qualifying Examination must be taken by October 1, at the beginning of the 5<sup>th</sup> semester. Extension of this deadline must be petitioned through the Dean's office and approved in writing by the Program Director.**

The student's thesis advisory committee should already be selected by the time of the qualifying exam. This committee, with an additional member who will replace the student's advisor, will carry out the qualifying examination. The advisor(s) should be present during the examination but will not be a voting member of the committee.

There will be four (4) voting members: 1) the research advisor, 2) at least one primary member of the Department of Biomedical Genetics, 3) an additional member of the GDSC program and 4) one faculty member from outside the GDSC program.

#### 3.1 Suggested Outline for Qualifying Examination Research Proposal

Double-spaced pages. A title and abstract page, required at the time of registration, should be included in addition to the sections listed below.

**Specific Aims:** State concisely and realistically what the research described in the proposal is intended to accomplish and/or what hypothesis is to be tested.

**Background and Significance:** Briefly sketch the background to the proposal and critically evaluate existing knowledge. State concisely the importance of the research described in the proposal by relating the specific aims to longer-term objectives.

**Preliminary Studies:** This section should summarize what work the student and others to indicate that the proposal is realistic and significant in scope have done. Graphs, diagrams, tables, and charts relevant to this section can be included as "Appendix" material.

**Proposed Strategy and Experiments:** Discuss in detail the experimental design and the procedures to be used to accomplish the specific aims of the work described in the proposal. Describe the protocols to be used and a tentative timetable for the investigation. Include the means by which the data will be analyzed and interpreted. Describe new methodology and its advantage over existing methodology. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. Include information about species of animals to be used. **Parts A-D of the proposal must not exceed 15 pages total. The chairman of the qualifying committee or any of its members may reject a proposal that exceeds the page limit and require it to be rewritten before the exam will commence.**

**References:** Use a standard journal format that includes all authors and the title of the article.

**Appendix:** Graphs, diagrams, tables, and charts supporting the proposal should be included in this section.

#### 3.2 Qualifying Examination Format

The student is expected to present an overview of the thesis research proposal for the first 15-20 minutes using blackboard, slides, overhead projector or a computer projector presentation. The committee will then examine the student orally. A typical examination will take between two and three hours. The candidate is judged on: the written and oral presentation; a grasp of the fundamental issues; the ability to apply the background from formal course work to problems related to the proposal; and a demonstration of critical assessment of results. It is important to recognize that while the written proposal serves as a focus for the oral examination, questions about related areas can be raised.

### 3.3 Program for the Degree of Master of Science Form

Your graduate program coordinator will complete a Program for the Degree of Master of Science form, setting forth the requirements for the student's degree. It will be filed with the office of Graduate Education & Postdoctoral Affairs at the time of registration, 15 working days prior to your exam. This form must list all formal courses (both specifically required and electives), seminars and research credits that the student must complete in order to obtain the Master of Science degree. Students must have completed a minimum of 30 credit hours of course work at the time of the Qualifying Exam, of which no more than 6 may be credits of research.

All core courses must be completed prior to scheduling the Qualifying Exam. However, in certain instances, if the 2<sup>nd</sup> elective or the teaching assistantship has not been completed the exam may be scheduled. In this case the degree will be held and not be conferred until the requirements are met.

Students in the Ph.D. Program in Genetics receive a "Plan B" Masters Degree after passing the Ph.D. Qualifying Examination.

**Procedure:** The Program for the Degree of Master of Science form is initiated in the department office along with the other forms needed to register the qualifying exam. The advisor and the program director must sign the forms. The department office must turn in the completed forms and documentation required to **register the qualifying exam in the Office of Graduate Education at least 15 full working days before the exam. Therefore, the student must schedule the time and location, hand in the thesis title, abstract and other department forms to the coordinator at least 20 full working days before the scheduled exam.**

The student should provide the following to the graduate program coordinator:

- A list of the members of the thesis advisory committee
- Date, time and place for the proposed qualifying exam
- One copy of the thesis title page
- One copy of the thesis abstract

### 3.4 Results of the Qualifying Examination

The Chair of the examining committee or the committee as a whole will discuss with the student the strengths and weaknesses of the qualifying exam performance and will inform the student whether or not he/she has passed. The Chair will also complete a written report that will be given to the program coordinator.

In the event that a student fails the examination, the GDSC faculty will review the student's performance and make a recommendation to the Senior Associate Dean of Graduate Education regarding action.

#### **4.0 THESIS ADVISORY COMMITTEE**

Following selection of the research advisor, the student's thesis advisory committee is selected at the beginning of the second year. The thesis advisory committee performs several functions. It may help the student choose specific elective courses in preparation for the chosen field of research. It provides advisory input during the development of the thesis research project with respect to scientific merit, techniques and methodology, relevant literature, etc. It gives final approval of the specific program presented for the thesis topic to be developed and (with exception of the advisor/advisors) participates in the Qualifying Examination. The advisory committee also mediates in case of tension between the advisor and the student. Finally, it, along with a representative appointed by the Dean's Office, is the examining committee for the thesis defense. Committee members may also provide more complete guidance in the selection of final courses in preparation for research and assist the thesis advisor. During the second year, the student and the research advisor must submit a list of suggested committee members to the Program Coordinator.

The thesis advisory committee should consist of at least four members:

1) the research advisor, 2) at least one primary member of the Department of Biomedical Genetics, 3) an additional member of the GDSC program and 4) one faculty member from outside the GDSC program.

Additional committee members may be included from either within or outside the University if it is considered useful or necessary. Thus, the minimum size of the committee will be five members, but six is quite possible. In the case of joint co-advisors, a minimum of six members may be required. All members of the committee must be of the rank Assistant, Associate or full Professor. Committee members may not be Research Assistant Professors.

## **5.0 YEARLY PROGRESS REPORT AND RESEARCH REVIEW**

A yearly progress report must be submitted to the Graduate Studies Coordinator. The original copy is emailed to Senior Associate Dean for Graduate Studies by June 1 of each academic year in order to have stipend funding approved for the following year. Students should plan to meet with their thesis advisory committee and provide a [Graduate Student Research Review form](#) to the Office of Graduate Education during each academic year. In the first year of studies, the laboratory rotation evaluations will be used to fulfill this requirement.

The annual meeting with the thesis advisory committee is usually set up on the same day as the student's seminar.

## 6.0 THESIS PREPARATION AND REGISTRATION

“Registering for PhD Defense” simply means that the student presents a thesis, which he/she intends to defend, to the Senior Associate Dean of the School and to the University Dean that governs all doctoral programs. Registration occurs on a date that allows 15 full working days to pass between the registration date and the actual defense date. When a student feels that he or she is ready to prepare for thesis defense, they should contact the graduate program coordinator. They will review the [PhD Thesis Defense Timeline](#) together to prepare for the registration process.

**The student must meet with the Director of the Ph.D. Program to discuss & view draft version of defense. Director’s approval is required prior to setting the date of defense.**

[A Guide for Graduate Students Preparing for a Defense](#) is a comprehensive guide, written specifically for SMD graduate students. The guide covers everything from before the defense, to the defense itself, to after the defense, providing information about the process, outlining requirements and offering useful tips.

At the University of Rochester, a chairperson is appointed for each PhD oral defense exam to monitor and promote fairness and rigor in the conduct of the defense. The chair's status as a nonmember of the advisor's and student's department or program enables distance from previously established judgments on the candidate's work and prevents the chairperson from exerting administrative authority over other members or being subject to such authority. In the graduate programs within the School of Medicine and Dentistry, the program director (with input from the advisor/student when appropriate) nominates three faculty members to serve as chair. The nominations are reviewed by the Senior Associate Dean for Graduate Education and one faculty member is approved to chair the defense exam.

**This form must be submitted to the Senior Associate Dean for Graduate Education to initiate the appointment of a doctoral defense chairperson at least 4 months prior to scheduling a defense date. When scheduling for the defense, the approved chair is included in the student's planning for specific dates.**

It is the responsibility of the student to see that style, format, margins, paper, binding, etc. are in accordance with University regulations. The student should be aware that the Dean of Graduate Studies has a deadline each year by which time a thesis must be registered in order to allow graduation at the next Commencement. Students must check [the School’s academic calendar](#) for this deadline. It will usually take at least three months to prepare the thesis after all experimental work is complete and the most common mistake is not allowing adequate time for preparation of illustrations, typing, review by the advisor and thesis advisory committee and for registration in the Graduate Dean's Office.

The School of Medicine and Dentistry has adopted an online thesis registration process. Students will meet with the graduate program coordinator to log in to [sharepoint](#) and create an account. They will fill out all of the necessary fields and then save the document. An email will then be generated by the program with will be sent to each of the committee members, prompting them to sign off on the student’s thesis.

Please contact Daina Bullwinkel ([daina\\_bullwinkel@urmc.rochester.edu](mailto:daina_bullwinkel@urmc.rochester.edu)) to schedule a meeting when you are ready to prepare for your thesis defense.

The Graduate Coordinator in the Education office will meet with the student at least 2 months prior to defense to review the online registration process. An online [Exit Interview Form](#) is required prior to or during the registration process. The thesis is submitted electronically to the dean’s office. The student must Poll your Defense Chair, Advisor and Advisory Committee to determine their preference for thesis format (hard copy/pdf).

**Please note:** Registration deadlines are final; therefore check in the Department Office for a schedule of dates for the academic year. In addition, final exams may not be scheduled during blackout periods, e.g. August through mid-September (see [academic calendar](#) for exact dates).

## **7.0 FINAL EXAMINATION AND TERMINATION**

Before the exam, the student's advisor will receive confirmation of the scheduling of the exam and name of the Chairperson of the Examining Committee appointed as the representative of the Dean of Graduate Studies.

The format of the Final Examination for the Ph.D. is as follows. The first hour of the exam is a formal seminar open to the public. The student's presentation should last 50 minutes and 10 minutes are allowed at the conclusion for questions from the audience. Notes, slides, charts, and the usual visual aids for a seminar are permitted. The student and the Examining Committee will then adjourn to a private session where the second part of the exam will be conducted. Using oral examination, the committee will scrutinize the student's comprehension, execution, description and interpretation of the research described in the thesis.

After successful completion of the Final Examination and after making any required corrections in the thesis, the student must submit one corrected copy of the thesis electronically to Proquest. In addition, one paper copy must be submitted to the Department Office.

The termination date will determine when the stipend payment will cease. The student should discuss this with his/her advisor.

## **7.1 HEALTH INSURANCE FOR GRADUATING STUDENTS**

Due to the implementation of the affordable care act insurance exchanges, Aetna Student Health is not longer available to students who defend between the end fall and spring semester. Students must register for their own health insurance. US students will be able to move from the student plan to an exchange plan.

Graduating students are encouraged to check their health insurance status to assure continuing coverage and access to health care following graduation. Coverage by the mandatory health fee continues through the end of the semester/term (July 31 for students graduating in the spring and December 31 for students graduating in the fall).

Go to this link for more information:

<http://www.rochester.edu/uhs/studentinsurance/InsGradStudents.html>

In most cases applications to extend health care must be completed 60 days prior to the termination of your current plan to assure continuous coverage.

You are encouraged to send an email to: [insurance@uhs.rochester.edu](mailto:insurance@uhs.rochester.edu) to obtain personal help in extending coverage depending on your personal needs.

International students may be eligible for moving to a plan through ISO, with [HTH Worldwide](#). Sumie Jacoby ([sumie.jacoby@rochester.edu](mailto:sumie.jacoby@rochester.edu)) has coordinated this piece.

## 8.0 M.D./Ph.D. PROGRAM

M.D./ Ph.D. program students usually enter the Ph.D. portion of their combined degree work after the basic science years of the M.D. curriculum. During the second year of the M.D. program, they should discuss the Ph.D. Program with prospective faculty advisors and the Genetics Program Director. It is optimal for the student to complete two research rotations before choosing a permanent advisor.

A total of 96 credit hours are required for the Ph.D. M.D./ Ph.D. Program course requirements are meant to be sufficiently flexible to accommodate students with diverse backgrounds and career goals.

### 8.1 Curriculum

**All of the following courses are required:**

GEN 507 (4 credits)	Advanced Genetics ( <i>Fall</i> )
IND 410 (4 credits)	Molecular Biology and Genetics ( <i>Spring</i> )
IND 501 (1 credit)	Ethics in Research ( <i>Fall</i> )
GEN 503/504 (1 credit)	Genetics Seminar* ( <i>each semester</i> )
GEN 595	Ph.D. Research* ( <i>each semester</i> )

\* Required each semester throughout the course of study and includes yearly presentations beginning at the end of year 2

### 8.2 Electives:

One elective is required. Below is a list of approved electives. The advisor and the program director may approve other electives.

#### *Fall Semester*

BIO 426 (4 credits)	Developmental Biology
BPH 509 (5 credits)	Molecular Biophysics
MBI 473 (3 credits)	Immunology
GEN 508 (4 credits)	Genomics & Systems Biology

#### *Spring Semester*

BCH 412 (5 credits)	Advanced Topics in Biological Macromolecules
GEN 506 (4 credits)	Stem Cell Biology (alt years w/GEN 508)
IND 407 (4 credits)	Structure and Function of Cell Organelles
IND 411 (5 credits)	Methods in Structural Biology
IND 443 (4 credits)	Eukaryotic Gene Organization & Expression I
IND 447 (4 credits)	Signal Transduction
MBI 456 (4 credits)	General Virology (odd numbered years)
IND 419 (3 Credits)	Intro to Quantitative Biology

### 8.3 Other Requirements

- Two research rotations should be conducted prior to joining a laboratory for dissertation research. Students are encouraged to complete these rotations during the first two years of the M.D. program.
- The Qualifying Examination is required at the end of the second year of the Ph.D. studies.
- The teaching assistant requirement is waived.
- At least one meeting per year with the thesis advisory committee (normally held after the student's Genetics Seminar presentation).
- A satisfactory thesis must be written and successfully defended.

## 9.0 GENERAL POLICIES

Space: The Department of Biomedical Genetics provides desk space for students on a first come, first served basis. Once a research advisor has been chosen, the student will usually be given a desk in the advisor's laboratory.

Copying, Supplies, etc.: In the first year of studies, the dean's office will provide a limited amount of support for copying charges. In the second and subsequent years of studies, the advisor's account should pay for work-related supplies, copying, etc.

Travel: Students may apply for very limited travel funds toward the end of their program to attend national or international meetings. Advisors are usually responsible for travel support.

Vacations: Graduate students in both programs are supported by fellowships or research grants from a variety of sources, both internal and external, and each agency has slightly different regulations regarding vacations. In general, most state that fellows and trainees are expected to engage in full-time study and are entitled only to official University Holidays (New Year's Day, Memorial Day, 4<sup>th</sup> of July, Labor Day, Thanksgiving Day and the Friday Following Thanksgiving Day, Christmas Day). Semester breaks are not to be considered holidays and any absence during those times must be approved in advance by the advisor. The Department must submit semi-monthly time reports on all graduate students and these are subject to close scrutiny by auditors from both the governmental accounting office and the University. Unjustified absences can jeopardize our already sparse funds. **Thus, every student should inform his or her advisor of *any* absence and an absence of more than two weeks must be cleared with the Office of Graduate Education in advance. Students will not receive stipends if absent without authorization.**

Parental leave: The University of Rochester School of Medicine and Dentistry (SMD) provides accommodation for its graduate students for the birth or adoption of children, as outlined in this policy. Graduate students are provided up to 8 weeks of leave for the primary care giver following the birth or the adoption of a child.\* During this period, students may postpone course assignments, examinations, and other academic requirements but remain active full-time students, with access to university facilities (including student health insurance, library privileges, and housing) and to university faculty and staff. While students will continue to be fully funded off any existing funding sources (e.g., fellowship, assistantship) during the leave period, students will be excused from regular teaching or research duties. However, it is the student's professional responsibility to work with her/his advisor or faculty member to prepare for the absence in advance of the leave. This includes reviewing the status and continuation of research projects, adequately preparing those who will assume teaching responsibilities during the student's absence, and arranging for a smooth transition in any other responsibilities.

Eligible graduate students are required to notify their Advisor and school Dean of Graduate Studies of the date of their intended time away at least 60 days prior (when possible) to the expected date of childbirth or adoption, using the [Parental Leave Request Form](#). While applications for parental leave are required, the benefit is automatic.

\* Note: These guidelines are consistent with the NIH Grants Policy Statement – parental leave (10/10). For those on NIH training grants, the Training Grant PD/PI must approve the use of parental leave.