MD-PhD Timeline – Overview for the “New” Curriculum

Please read the detailed material that follows carefully

The new curriculum—and the opportunity to begin PhD studies earlier than in past years, i.e. in the Fall of Year 3—will undoubtedly change the timeline for MD-PhD students matriculating in Fall of 2015 and thereafter. The timeline outlined below may be revised as PhD-granting departments evaluate the impact of the new curriculum on MD-PhD coursework and timeline to the PhD.

Year 1:
- Discuss course selections with Dr. Kazmierczak, Dr. Gorelick and your Faculty Mentor
- Current MD-PhD students can also offer insight into courses
- You must earn 2 Honors within the first 2 years of the Program to satisfy the Graduate School’s Honors requirement
- Start thinking about your future research interests
- Every student completes 2 six-week laboratory rotations during the summer after the first year.

Year 2:
- Discuss course selections with Dr. Kazmierczak, Dr. Gorelick and your Faculty Mentor
- All students must engage in 6 months of clinical clerkships
- Identify a thesis lab by the spring semester of Year 2 and complete affiliation paperwork

Year 3:
- We encourage students to take Step I of the Boards in July/August after completion of year 2. Step I must be completed by December 31st of this year.
- Begin Graduate School courses
- Meet with the Director of Graduate Studies (DGS) of the Ph.D. department to discuss the timing and protocol for the qualifying exam

Year 4:
- Continue with courses in the Graduate School and continue thesis research
- Complete the Qualifying Examination and thesis prospectus by the fall semester of Year 4

Year 5 to Completion of Thesis:
- Continue thesis research
- Thesis must be approved and defended prior to re-entry to medical school
- Submission of a first-author peer reviewed science manuscript is encouraged
- Meet with Associate Director for Clinical Affairs to complete Re-Entry requirements

Any digression from this timeline must be discussed and approved by the DGS and the MD-PhD Program and documented in the student’s file. Continued participation in the MD-PhD Program requires timely completion of requirements.

Medical School Curriculum
The Integrated Basic & Clinical Science Curriculum includes eight Master Courses, three Longitudinal Courses, and nine Longitudinal Threads spread out over the first eighteen months of study for all medical students.
The Integrated Basic & Clinical Science Courses include:

**Eight Master Courses**
- Introduction to the Profession
- Scientific Foundations
- Genes & Development
- Attacks & Defenses
- Connection to the World
- Energy and Metabolism
- Homeostasis
- Across the Lifespan

**Three Longitudinal Courses**
- Professional and Ethical Responsibility
- Human Anatomy
- Scientific Inquiry: Biostatistics and Research Methods

**Nine Longitudinal Threads**
- Biochemistry
- Cell Biology
- Embryology
- Genetics
- Pathology
- Public Health and Clinical Epidemiology
- Pharmacology
- Physiology
- Diagnostic Methods

For a complete view of the curriculum, please go to [https://medicine.yale.edu/education/curriculum/integrated/](https://medicine.yale.edu/education/curriculum/integrated/)

**MD-PhD Timeline**

**Year One:** MD-PhD students complete courses in the Medical School. One of the first decisions entering MD-PhD students will have to make in the first two weeks of the Program is what graduate courses to take for credit. In addition to Dr. Kazmierczak, you can discuss courses with your assigned Faculty Mentor. Registration for MD/PhD students (courses, clinical clerkships, dissertation research, etc.) is processed online and through the MD/PhD Program Office. Sue will assist you in the registration process at the beginning of each semester. The Graduate School requires that you obtain two Honors during the first two years of the Program to continue registration. That is their only requirement, but it is strictly enforced. A number of first and second year courses, required and elective, can be taken for the Honors requirement.

You will be responsible for selecting your course work; there are no specific course requirements for MD-PhD students. You should take courses that interest and excite you and that are relevant to your future graduate program.

Some of the required Medical School courses are co-listed as Graduate School courses and are required courses for some of the graduate programs. The more of these courses that you take for credit in the Graduate School during your first and second years, the fewer course requirements you will have to satisfy later in the Graduate School years. In general, it is a good idea to take as many of the first- and second-year Medical School courses for credit in the Graduate School as possible. To receive credit for these courses in the Graduate School, you must list them on your Graduate School Course Enrollment Form, so they appear on your Graduate School transcript.

- Now is the time to begin thinking about your future research interests, which graduate program would be most appropriate, and their course requirements.

For example, the INP and Neurobiology Programs require you to take Principles of Neuroscience (Neuroscience 501a) and Structural and Functional Analysis of the Human Nervous System (Neurobiology 500b). You will take the Neurobiology 500b automatically as part of the first-year Medical School curriculum. The INP
strongly recommends that students who have a strong interest in the neurosciences also take the “Principles” course in their first year because of educational and scheduling issues that arise if taken later. Please speak with Charles Greer, Director of the INP and Carol Russo, Administrator of the INP, for details.

Another example is Cell Bio 502 a/b/c, listed in the Graduate School catalogue. It is one of the required courses for the Cell Biology Program and an elective for the INP and MB&B Programs. To receive credit for this course you must provide your grades to Dr. Peter Takizawa on the questions that been graded as part your qualifier.

Finally, MB&B 800 can be taken in place of the Biochem course conferences. That will entail reading original papers, etc. MB&B 800 is an elective for the INP and MB&B Graduate Programs. Please discuss details of this course with Dr. Susan Baserga, the course director.

- Cell Biology 601 and MB&B 800 are courses that were primarily designed for MD-PhD students. Again, we strongly suggest that you sign up for these courses if your interests are in biochemistry, cell biology, genetics, developmental biology, or related disciplines. Cell Biology 601 is a requirement for the Cell Biology Graduate Program and electives for the INP and MB&B Graduate Programs. To reflect the specific educational goals of MD-PhD students, the content of this course has been designed to provide a foundation for your careers as physician-scientists. In this course you will receive valuable experience in researching, critically evaluating and presenting scientific information while working one-on-one with a faculty mentor. This course has been a favorite of both students and mentors and has shaped laboratory rotations for many students.

This summary illustrates which courses can be taken during your first year. Look carefully at the course requirements for individual programs in the pages that follow -- and check with the DGS of the relevant program(s) for further details and updates. Requirements do change and there can be flexibility depending on your background. However, the final say concerning requirements is left up to the DGS and graduate program faculty. Don’t forget, there will be time to take Graduate School courses when you affiliate with a graduate program in your third year. Be aware that Medical School courses listed as required graduate program courses may not substitute for upper-level graduate courses in the individual programs. Each program has its own upper-level courses you that are required to insure that your PhD training is on a par with that of regular PhD students.

Your graduate course work should provide exciting opportunities for new learning and supplement and reinforce your core medical school course. However, we offer a word of caution - there are many exciting educational opportunities at Yale, but you must also avoid being overloaded by taking an excessive number of courses. Such pursuits may compromise your ability to focus on what you must learn to advance through your first two years.

- Please schedule time to individually talk to us about graduate courses in the Program offices where we will have more details and contact numbers. Also, discuss this issue with senior MD-PhD students who have recently and successfully navigated these waters.

Summary Points:
- Discuss course selection with Dr. Kazmierczak, Dr. Gorelick, or your Faculty Mentor
- You must earn 2 Honors within the first 2 years of the Program to satisfy the Graduate School’s Honors requirement
- Start thinking about your future research interests

Early Matriculation. Incoming students have the option of matriculating early (before beginning first-year medical school classes) to do their first lab rotation at Yale through the START@Yale program.
Lab Rotations

- Every student should plan on doing two 6-week laboratory rotations during the summer after the first year.

Selecting the labs in which you will rotate is one of the most important things you will do during your first year. There will be many opportunities to inform your selection. For example, when invited, attend Departmental Retreats. These provide unique opportunities to meet faculty in a relaxed setting and learn about their work. Also, contact potential mentors to meet them, their lab members and attend their lab meetings.

**Year Two:** While taking courses in the Medical School during the first half of the academic year, you will need to fulfill the 2 Honors requirements for the Graduate School.

**Spring Semester of Year Two:**

- All students must engage in 6 months of clinical clerkships. Any exceptions to this policy must be confirmed by Dr. Kazmierczak and conveyed to Cheryl. (See MD-PhD Students and Clerkship Requirements at page 31.)

- Step I of the Boards is taken by December 31st after completion of year 2.

**Year Three:**

- By July at the start of the third year, a thesis lab should be identified and all paperwork should be completed (affiliation form completed and submitted to the MD-PhD Office).

The student begins Graduate School courses. You must meet with the Director of Graduate Studies (DGS) of the Ph.D. department to discuss the timing and protocol for the qualifying exam, which is separate from course examinations, which leads to admission to candidacy for the Ph.D.

There is a residency requirement imposed by the Graduate School. Students seeking the Ph.D. degree are required to be in residence in the New Haven area during at least three academic years. Any exception to the residency requirement must be approved by the Ph.D. department and by the appropriate associate dean.

**Summary Points:**

- Students should complete two 6-week laboratory rotations during the summer after the first year.
- Step I of the Board examination must be taken by December 31st following completion of Year 2.
- By the end of the 2nd year, a thesis lab should be identified and paperwork processed
- Students begin their third year as graduate students affiliated with a PhD department and lab. Students must speak with their DGS to confirm remaining course requirements for the PhD and to follow the department’s schedule for the qualifying exam.

**Year Four:** MD-PhD continue thesis research. Students complete their TA requirements during this year and are encouraged to prepare and submit a NRSA F30 fellowship proposal. The thesis prospectus must be approved and submitted to the Graduate School by the end of the second year of affiliation, i.e. the end of Spring Semester of Year Four. When the Thesis Committee approves the Prospectus, required paperwork is delivered to the Ph.D department so the department can complete the Admission to Candidacy paperwork and submit it to the Graduate School. The Prospectus must be submitted to the Graduate School at least six months before the dissertation is submitted.

Each student must complete the Qualifying Examination within one year of laboratory/program affiliation, i.e., by the fall semester of Year Four. This is a Graduate School rule and failure to comply may prevent Graduate School registration for the following semester. Your thesis prospectus must be approved and submitted by the end of Year Four.
**Year Five to Completion of Thesis:** MD-PhD students take courses in the Graduate School and continue thesis research.

Typically an MD-PhD student will complete and defend the dissertation during fall semester of Year Six. A copy of the dissertation should be provided to the MD/PhD Program Office.

- MD-PhD students must have their written thesis submitted and approved and defend their dissertations before returning to fulfill the remaining Medical School clinical requirements.

The Program has two mechanisms for monitoring the student’s progress in the lab: (a) bi-annual advisor reports containing a checklist of academic requirements for the Ph.D., including thesis committee meetings; and (b) assigning an Associate Director of the MD/PhD Program to attend at least one thesis committee meeting annually and in the final research year, sit as a member of that student’s thesis committee. We have asked each MD/PhD student to contact the assigned Associate Director and include him/her in the thesis committee meetings.

Failure to meet academic deadlines can cause an MD/PhD student to remain in the Program for up to 1 additional year. This becomes problematic for the Program in funding the student, and problematic for the student in planning for residency matching.

The student returns to Medical School and completes all remaining requirements and graduates in May.

**Summary Points:**

- MD/PhD students must have their written thesis submitted and approved and defend their dissertation prior to re-entry to the wards.
- The Program monitors student’s laboratory progress through: i) bi-annual advisor reports and ii) assigning an Associate Director of the Program to each thesis committee.

**Completion of Medical School Requirements and Re-entry to the Wards**

It is essential that students who have been in the lab have the appropriate clinical skills when they return to the wards. The MD/PhD Program has determined that after a prolonged absence, *i.e.* one year or longer, the student must engage in a “warm-up” period. Students who have participated in a longitudinal experience generally do well when re-entering the clinical setting. It is vital that students have choices to accommodate their at times complicated schedules and laboratory commitments. (*See section on Re-entry for details.*)

While this Overview is considered a guideline for a typical MD-PhD student, we recognize that not every student will follow this path.

Any digression from this timeline must be discussed and approved by the DGS and the MD-PhD Program and documented in the student’s file. Continued participation in the MD-PhD Program requires timely completion of requirements.