

Handbook for Ph.D. Students

Department of Physics and Astronomy

University of Missouri-Kansas City

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Handbook for the UMKC Interdisciplinary Ph.D. Program with Physics as the Coordinating Discipline

This handbook outlines the steps that a prospective or current graduate student must take to complete the Interdisciplinary Ph.D. program with Physics as the coordinating discipline starting from application and progressing all the way through to graduation.

0. Understand the Nature of the UMKC Interdisciplinary Ph.D. Program

- The UMKC IPhD program is housed inside the UMKC [School of Graduate Studies](#). The various other colleges and schools (e.g. education, engineering, ...) are member participants in the IPhD program, but the program is managed and directed by the School of Graduate Studies.
- Read the UMKC Catalog pages for the IPhD program from the [School of Graduate Studies](#) generally and from the [Department of Physics and Astronomy](#) specifically.
- Study the videos on the UMKC School of Graduate Studies [Youtube channel](#).

1. Applying for Admission to the IPh.D. Program

- If you wish to apply for admission to the IPh.D. program with physics as the coordinating unit, fill out an application at: <https://www.umkc.edu/apply/>
- For the application, be sure to:
 - Include transcripts from all post-secondary schools attended.
 - Select the co-discipline field that you believe you would most like to partner with Physics (e.g. Chemistry, Mathematics, Geology, ...). This selection may be changed after admission fairly easily (Form IPhD-12), **but** it is easier to make a good decision now than it is to change it later.
 - Submit your GRE score.
 - The GRE subject test in physics is strongly encouraged for any applicant seeking a funded (graduate teaching assistant) position.
 - Arrange for three letters of recommendation to be sent directly to the School of Graduate Studies (SGS).
 - If you are an international student you will also need to submit a TOEFL or IELTS English language proficiency score.
 - Submit a written personal statement. A good statement will be an evidence-based document that shows why you will be able to complete the degree and that gives a clear indication that your research interests align with those of potential research advisors in the department.
- Contact the department graduate advisor for admissions, Professor Rulis (rulisp@umkc.edu, Flarsheim Hall, room 250D), to inform him of your application. He can ensure it goes through as quickly as possible.
- To have the greatest chance of acceptance, it is recommended that you apply by March 1st for fall semester admittance and by October 1st for spring semester admittance. If you are seeking a funded (graduate teaching assistant) position then the above dates should be considered as hard deadlines.

2. Course-Work

- Each year—including at the beginning of your first year—you will need to discuss your annual progress and your plans for the next year with the department graduate advisor for student progress, Professor Brodwin (brodwinm@umkc.edu, Flarsheim Hall, room 250L). These meetings are in addition to any regular meetings that you have with your research advisor or your committee.
- If you have difficulties registering, see the office support assistant, Gloria Frazier (frazierg@umkc.edu, Flarsheim Hall, room 257).
- You will need to satisfy School of Graduate Studies requirements and also Department of Physics and Astronomy requirements. The most important SGS requirements are (1) a total of thirty hours of course-work plus twelve hours of dissertation research; and (2) the course-work is distributed in a 60/40 ratio between the primary discipline and co-discipline. The Department of Physics and Astronomy requirements comprise a list of core courses as listed in the UMKC catalog: <https://catalog.umkc.edu/colleges-schools/graduate-studies/physics/>.
- A minimum of twelve credit hours of Physics 5699 (dissertation research) is required.
- Talk to the graduate advisor in your co-disciplinary department to determine their course requirements.

3. Departmental Qualifying Exam

- You will need to pass the departmental written exam at the Ph.D.-qualifying level. This exam is offered at the beginning of the spring semester. You should receive a notice that informs you of the date and asks you to sign up to take it.
- All graduate students (MS and PhD) that have not passed this exam at the level necessary for the degree being sought *must* take the exam.
- After assessing each student's performance on the Qualifying Exam, the Departmental Examining Committee will send you a letter confirming your status.
- Each student will be given two opportunities to pass the exam at the level necessary for the degree being sought.

4. Forms

- You are strongly encouraged to carefully study all of the information at the School of Graduate Studies web site: <http://sgs.umkc.edu/>.
- You can find all the forms necessary to your degree on the Forms section of the SGS website <http://sgs.umkc.edu/forms/> (listed under "Forms For Interdisciplinary Ph.D. Studies".)
- It is your responsibility to get on top of and stay on top of all administrative aspects of your progression through the IPhD program. The graduate advisors in the Department of Physics and Astronomy already aggressively lobby on your behalf for the upper administration at UMKC to provide an effective administrative environment for you. Because of this you, will have a fairly clear path through the program with clear expectations. At the same time, by establishing administrative rules and regulations UMKC can maintain a high level of quality control over the extremely diverse range of graduate degrees that the university offers. The forms and rules are generally in place for good reasons and attempting to "slide through" administrative responsibilities will only hurt you and your fellow students in the end.

5. Choosing an Advisor and Dissertation Committee

- Within your first semester, you must choose a Physics faculty member to be your dissertation advisor. If you are unsure about which faculty member you would like to work with, you may read the faculty profiles on our department web page to determine whose research interests most closely align your own. You should then contact the faculty member and set up a time to meet. Faculty members are very open and eager to have such meetings.
- Once you have chosen an advisor, you will need to form your dissertation committee. This committee typically consists of three faculty members from the Department of Physics and Astronomy plus two from your co-discipline. Your dissertation advisor will help you to choose the committee members. Once your dissertation committee is formed, then you will need to submit the Annual Evaluation Form (Form IPhD-1) to SGS. You will also need to write and submit a Plan of Study (Form IPhD-2) to SGS for approval.
- It is usually expected that you deliver a presentation to your research advisory committee that describes your Plan of Study. The goal is to get all of your committee members onto the same page with what your project is and where you intend for it to go. You should view this as an opportunity to tap into the varying forms of expertise that your committee members have and to let them help guide you as you move into the naturally uncharted territory that comprises a PhD dissertation project.
- The Plan of Study ***must*** be completed within the first two years after admission to the IPhD program.

6. School of Graduate Studies and Departmental Comprehensive Exam

- You will need to pass the departmental comprehensive exam.
- At least five weeks prior to the exam date, you will need to submit Form IPhD-3 to the School of Graduate Studies (SGS). This form authorizes you to take the exam and it confirms appointment of the examining committee (which is usually the same as your research advisory committee).
- The exam consists of submitting a research proposal and making an oral defense of the proposal to your dissertation committee. Your committee will need to complete a Proposal Approval Form (IPhD-5), which you will submit to the Dean of SGS. SGS requires a Ph.D. student to pass the comprehensive exam at least seven months prior to graduation.
- Upon completion of the exam, Form IPhD-4 will need to be filled out by your examining committee.

7. Dissertation Related

- The main task in pursuing a Ph.D. degree is to complete a dissertation. The School of Graduate Studies will email you a progress report form (Form IPhD-1) each spring to ensure that you are making appropriate progress. Complete the form, ask your coordinating and co-discipline advisors to fill in the additional information, and then submit it.
- At least two semesters before your targeted graduation date, check with SGS to see if their records show that you have fulfilled all the course work listed in your plan of

study. If there are any deficiencies, assuming there is a legitimate reason (*e.g.*, the courses have not been offered recently), you need to ask your dissertation advisor to submit a petition to SGS for making a modification to the plan of study (Form IPhD-9).

- When you are ready to write your dissertation (after consultation with your advisor) go to: <https://sgs.umkc.edu/current-students/thesis-dissertation-guidelines/> to check the format requirements for the dissertation and the dissertation completion timeline. Plan well ahead and adhere strictly to the formatting guidelines from the beginning of the writing phase.
- You are strongly advised to make use of a template that includes all typical components of a dissertation with proper formatting. Templates will soon be available for download in MS Word and LaTeX format from the Department of Physics and Astronomy web page.
- You are strongly advised to learn how to use your document editing program (*e.g.*, MS Word or the LaTeX editor of your choice) as soon as possible for making sections, making new chapters and appendices, inserting figures with captions, inserting tables with titles, inserting numbered equations, inserting references, etc. Similarly, you are advised to make use of a citation management system such as Zotero or Mendeley.
- When you have finished modifying the template to include all the structural and formatting changes appropriate for your dissertation and when you have added some content to each section then you will need get “format approval” from SGS. To do this you need to provide a copy of the (structurally complete and fully formatted but content incomplete) dissertation to SGS along with Form IPhD-6.
- You need to schedule your oral defense with your committee members. The defense should be at least one week before the last day of classes of the semester in which you plan to graduate but it can be done at any time within the semester in which you plan to graduate.
- Ask each committee member if he/she prefers a digital or hard copy of your dissertation and then give the appropriate copy to each of your committee members at least one month before your oral defense.
- Before your oral defense, print out copies of the necessary forms (one copy of Form IPhD-7 for the whole committee and one copy of Form IPhD-8 for each member of the committee). Your advisor and dissertation committee members will fill out the forms and send them to SGS after your defense. Note that Form IPhD-7 is an evaluation of your dissertation defense while the Form IPhD-8 is an evaluation of the dissertation itself.
- After you defend your dissertation you will most likely need to make further modifications to your dissertation to accommodate committee member suggestions, issues, and concerns that arose during their reading of your dissertation or during the defense itself.
- Once you submit changes that accommodate or rebut all committee member suggestions and your advisor approves, then your advisor will submit the final evaluation forms (Form IPhD-8 from each committee member) to SGS. You will then need to send your dissertation to SGS for their final approval. Once SGS accepts your dissertation they will issue you a certification of acceptance. You then need to log into the UMKC electronic thesis deposition (ETD) administration site at <http://www.etsadmin.com/cgi-bin/school?siteId=324>, set up an account and follow the on-screen instructions for uploading a PDF file of your dissertation.

- You will need to pay (or ask your advisor to pay) approximately \$45 via credit or debit card for the UMKC archival copy. You will also have an opportunity to order additional copies of your dissertation.
- **Please note that the responsibility for the timely submission of your dissertation and appropriate paperwork rests with you.** If you are unsure of any dissertation or graduation related due dates, ask the School of Graduate Studies.
- Be aware that there are large number of practical and administrative tasks that must be completed before your thesis can be accepted. Administrative time-lines are quite constrained because of the large number of other students that are rushing to get their work done. At the same time, faculty availability is often limited and it is usually doled out on a first-come-first-serve basis. If you don't plan ahead and stay on target with the deadlines then you can easily have your graduate delayed by a whole semester just because of an otherwise small random perturbation in someone's schedule.

8. Graduation

- At the beginning of your final semester you need to fill out the Application for Graduation form. It can be found at: <http://sgs.umkc.edu/forms/>. Submit this to SGS. It is due near the beginning of the semester and must be turned in on time in order for you to graduate.

9. Tips, Tricks, and Advice

- If you are not already a Missouri resident, at the end of your first year, petition to become one.
- At all times: Plan ahead and actively maintain timelines, schedules, and checklists.
- Take advantage of technology for making coordination with your dissertation committee and other activities easier. (e.g. use Doodle.com for coordinating meeting times, ask your advisor to reserve the department conference room with Google Calendar, create mailing lists for email communication, etc.)
- Do not be afraid to ask questions, especially in the early days. It is better to learn what you need to know about the process at the beginning rather than at the last minute.
- Get to know the names, positions, office locations, and responsibilities of all the individual people with administrative roles that you will need to interact with during your progression through the program. Many of them have been at UMKC for a decade or longer with a variety of roles and they can provide you with invaluable guidance. To learn this information you should study the web sites of the [Department of Physics and Astronomy](#), the [College of Arts and Sciences](#), and the [School of Graduate Studies](#). If you are not sure whom to contact then start by contacting the administrative assistant for the appropriate office.
- Provide feedback about this checklist so that it can be improved for future generations of students.

Physics & Astronomy Fall/Spring-Semester Schedule

FALL	SPRING
Undergraduate	Undergraduate
130 online (8 wk course) – Physics of Sports*	130 online (8 wk course) – Physics of Sports
130 online – Physics of Sports*	130 online – Physics of Sports
140 – How Things Work*	140 online – How Things Work
153L – Intro to Astronomy Lab*	150-E Intro to Astronomy – Motion of the Cosmos*
210 – General Physics I	155-O Intro to Astronomy – Starlight and Star Stuff*
220 – General Physics II	210 General Physics I
240 – Physics for Scientists & Engineers I	220 General Physics II
250 – Physics for Scientists & Engineers II	240 – Physics for Scientists & Engineers I
	250 – Physics for Scientists & Engineers II
Upper Level	Upper Level
310 – Mechanics I	311 – Mechanics II
330 – Methods of Theoretical Physics I	350 – Modern Physics – W/Engineering Applications
355-E – Stellar Astrophysics**	353-E – Practical Astronomy**
356-E – Galaxies**	410 – Thermal Physics
410A – Physics of Sci. Fiction	420-E – Optics
460 – Electricity and Magnetism I	437-E – Nuclear and Particle Physics
472 – Intro to Quantum Mechanics	450-O – Intro to Solid State Physics
	461 – Electricity and Magnetism II
	465-O – Cosmology**
Undergraduate Labs	Undergraduate Labs
395L-E – Computer Interfacing Lab	385L – Physics of Electronics Lab
476-O Advanced Lab	
Graduate	Graduate
5500-O – Methods of Mathematical Physics I	5590-E – Applied Scientific Computing
5501-E – Methods of Mathematical Physics II	5521-O – Electromagnetic Theory & Applications
5520-E – Electromagnetic Theory & Applications	5531-E – Quantum Mechanics II
5530-O – Quantum Mechanics I	5535-O – Optical Properties of Matter
5540-O – Statistical Physics	5537-E – Nuclear & Particle Physics
5555-E – Stellar Astrophysics	5553-E – Practical Astronomy
5556-O – Galaxies	5565-O – Cosmology
5510-E – Theoretical Mechanics I	5570-E – Quantum Theory of Solids
Graduate Labs	Graduate Labs
5595L-E – Computer Interfacing Lab	5585L – Physics of Electronics Lab

*Cross-listed as Physics (PHYS), Astronomy (ASTR), and/or Nat. Sci. & Phy. Sci.

**Cross-listed as Physics (PHYS) and Astronomy (ASTR)

As of 6/27/2018

Physics & Astronomy Annual/Biennial Schedule

Yearly	Even Years	Odd Years
Undergraduate	Undergraduate	Undergraduate
130-SF online – Physics of Sports* (8 wk)	150-S Intro Astro – Motion of the Cosmos*	155-F Intro Astro – Starlight & Star Stuff*
130-F online – Physics of Sports*		
140-FS online – How Things Work*		
210-FS – General Physics I		
220-FS – General Physics II		
240-FS – Physics for Sci. & Eng. I		
250-FS – Physics for Sci. & Eng. II		
Upper Level	Upper Level	Upper Level
310-F – Mechanics I	353-S – Practical Astronomy**	450-S – Intro to Solid State Physics
311-S – Mechanics II	355-F – Stellar Astrophysics**	465-S – Cosmology**
330-F – Methods of Theoretical Physics I	356-F – Galaxies**	
350-S – Modern Physics	420-S – Optics	
410-S – Thermal Physics	437-S – Nuclear and Particle Physics	
460-F – Electricity and Magnetism I		
461-S – Electricity and Magnetism II		
472-F – Intro to Quantum Mechanics		
Undergraduate Labs	Undergraduate Labs	Undergraduate Labs
153L-F – Intro to Astronomy Lab*		
385L-S – Physics of Electronics Lab	395L-F – Computer Interfacing Lab	476-F Advanced Lab
Graduate	Graduate	Graduate
	5501-F – Methods of Math. Physics II	5500-F – Methods of Math. Physics I
	5510-S – Theoretical Mechanics I	5521-S – Electromagnetic Theory & Apps II
	5520-F – Electromagnetic Theory & Apps I	5530-F – Quantum Mechanics I
	5531-S – Quantum Mechanics II	5535-S – Optical Properties of Matter
	5537-S – Nuclear & Particle Physics	5540-F – Statistical Physics
	5553-S – Practical Astronomy	5556-F – Galaxies
	5555-F – Stellar Astrophysics	5565-S – Cosmology
	5570-S – Quantum Theory of Solids	5590-S – Applied Scientific Computing
Graduate Labs	Graduate Labs	Graduate Labs
5585L-S – Physics of Electronics Lab	5595L-F – Computer Interfacing Lab	