

Handbook for M.S. Students

Department of Physics and Astronomy

University of Missouri-Kansas City

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Handbook for the UMKC Master of Science in Physics Program

This handbook outlines the steps that a prospective or current graduate student must take to complete either the thesis-based or the coursework only MS program in Physics starting from application and progressing all the way through to graduation.

0. Understand the Nature of the UMKC MS in Physics Program

- Unlike the Interdisciplinary PhD program, the UMKC MS program is *not* managed through the centralized School of Graduate Studies except for a few specific aspects mostly related to formatting standardization of MS theses. Instead, the UMKC MS program in Physics is housed inside the UMKC College of Arts and Sciences. The various other colleges and schools (e.g. education, engineering, ...) each manage their own MS programs independently.
- Read the UMKC Catalog pages for the MS program in Physics from the [Department of Physics and Astronomy](#).

1. Applying for Admission to the MS in Physics Program

- If you wish to apply for admission to the MS program in Physics, fill out an application at: <https://www.umkc.edu/apply/>
- For the application, be sure to:
 - Include transcripts from all post-secondary schools attended.
 - 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 if you are pursuing a thesis-based MS degree.
- 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 are pursuing as thesis-based MS degree.
- If you have difficulties registering, see the office support assistant, Gloria Frazier (frazierg@umkc.edu, Flarsheim Hall, room 257).
 - You will need to satisfy Department of Physics and Astronomy coursework requirements. The Department of Physics and Astronomy requirements are different for thesis-based and coursework-based MS degrees. Please read the UMKC catalog pages for the MS degree in Physics: <https://catalog.umkc.edu/colleges-schools/arts-sciences/academic-departments-programs/physics-astronomy/master-of-science-physics/>.
 - For the thesis-based MS degree, a total of 30 credits is required. Of those, 24 must come in the form of coursework and those 24 must include the required core courses as listed in the catalog. The remaining 6 credits come in the form of 5599 (Research and Thesis) hours.
 - For the coursework-based MS degree, a total of 33 credits is required. All 33 credits must come in the form of coursework and those 33 must include the required core courses as listed in the catalog.

3. Departmental Comprehensive Exam

- You will need to pass the departmental written exam at the MS-comprehensive 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 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/>. Most of the important forms for students pursuing a thesis-based MS degree can be found there.
- There are also forms for requesting Travel Grants from the School of Graduate Studies and for receiving a reimbursement for travel expenses incurred on a travel grant.
- The most important form that is *not* present on the SGS web site is the MS Program of Study form. This form is required for all thesis-based ***and*** coursework-based MS degree seeking students. The form can be downloaded from the [Department of Physics and Astronomy web site](#). You should complete this form at the beginning of the second year when you meet with Prof. Brodwin for your annual coursework progress review meeting.
- It is your responsibility to get on top of and stay on top of all administrative aspects of your progression through the MS degree 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 Thesis Committee**

- Within your first year, you must choose a Physics faculty member to be your thesis 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 thesis committee. This committee typically consists of three faculty members from the Department of Physics and Astronomy. Your thesis advisor will help you to choose the committee members. Your committee members will need to sign on to your MS program of study.
- The Program of Study ***must*** be completed before the end of the first semester of your second year after admission to the MS program. (This is typically done sometime near the beginning of the third semester of study.)

6. **Thesis Related**

- A key task in pursuing a thesis-based MS degree is to complete a research thesis.
- Two semesters before your targeted graduation date, you should check with Registration and Records to confirm that you have fulfilled all the course work listed in your program of study or that you will complete it in the upcoming semesters. If there are any deficiencies, assuming there is a legitimate reason (*e.g.*, the courses have not been offered recently), you need to coordinate with your thesis advisor to submit a new program of study. No special form is required, you simply submit a new Program of Study form and it will override the old one.
- When you are ready to write your thesis (after consultation with your advisor) go to: <https://sgs.umkc.edu/current-students/thesis-dissertation-guidelines/> to check the format requirements for the thesis and the thesis 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 thesis 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 thesis 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 the “Preliminary approval of Thesis or Dissertation by Supervisory Chair” form from the SGS web site.
- 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 thesis 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 the “Results of Oral Examination” form for the whole committee and one copy of the “Master’s Thesis FINAL Evaluation Form” for each member of the committee). Your advisor and thesis committee members will fill out the forms and send them to SGS after your defense. Note that the “Results of Oral Examination” form is an evaluation of your thesis defense while the “Master’s Thesis FINAL Evaluation Form” is an evaluation of the thesis itself.
 - After you defend your thesis you will most likely need to make further modifications to your thesis to accommodate committee member suggestions, issues, and concerns that arose during their reading of your thesis 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 to SGS. You will then need to send your thesis to SGS for their final approval. Once SGS accepts your thesis 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 thesis.
 - 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 thesis.
 - **Please note that the responsibility for the timely submission of your thesis and appropriate paperwork rests with you.** If you are unsure of any thesis 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.

7. 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.

8. 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	