THE UNIVERSITY OF TEXAS MD Anderson Cancer Center | UTHealth Houston

Graduate School of Biomedical Sciences

Graduate Program in Medical Physics

Student Handbook

Please note that some of the advice in this handbook may have been temporarily superseded in response to the coronavirus pandemic. For example, the observations about on-site attendance do not apply quite so strictly while we are working and attending lectures remotely.

August 19, 2022

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MEDICAL PHYSICS PROGRAM CONTACTS

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Deputy Program Director	**Kyle Jones, Ph.D.** FCT14.5026 (713)563-0552 kyle.jones@mdanderson.org Unit 1472, Department of Imaging Physics
Director of Program Admissions	**Laurence Court, Ph.D.** FCT8.6014 (713)563-2546 lecourt@mdanderson.org Department of Radiation Physics
Program Co-ordinator	**Lisa Echeverry** FCT8.6062 (713)563-2548 lecheverry@mdanderson.org Department of Radiation Physics

Most of the medical physics classes are taught in the Pickens Tower (also known as the Faculty Center Tower or FCT and not to be confused with the building immediately to the north of it, the Faculty Center or FC), in rooms FCT14.5059, FCT8.6091 and FCT8.6007, and in the Duncan Building (also called the Cancer Prevention Building or CPB), in room CPB5.3312. A few are taught in the Basic Science Research Building, in room S3.8371 near the Graduate School offices.

There is a lot of information related to the Graduate School and the Program on the intranet and Internet.

- Program Directors' Blog: https://collaborate.mdanderson.org/sites/GraduateProgramMedicalPhysics/default.aspx. Please inform the Program Office if you cannot read it. This is used for notices that are not urgent but merit some degree of permanence such as openings for fellowships, residencies and jobs and notices of special conferences. Consider using the "Alert Me" feature in order to be notified when new articles are posted.
- Medical Physics Program Web site: https://gsbs.uth.edu/medphys. You will find the most recent edition of this handbook there.
- GSBS Web site: https://gsbs.uth.edu/
- Canvas: https://www.uth.edu/canvas
- MYUTH: https://my.uth.tmc.edu
- MD Anderson Department of Radiation Physics: https://www.mdanderson.org/research/departments-labs-institutes/departments-divisions/radiation-physics.html
- MD Anderson Department of Imaging Physics: https://www.mdanderson.org/research/departments-labs-institutes/departments-divisions/imaging-physics.html

In the fall of 2022, there will be some changes in the Graduate Program governance. Dr. Wendt, who has served as the Program Director for the past nine years, has concluded his term of office in that role, but will remain in the program in an advisory capacity. Dr. Howell will take on the role of Program Director. Consequently, the graduate program operations will transition from Dr. Wendt's home department of Imaging Physics to Dr. Howell's home department of Radiation Physics. A new Program Co-ordinator, Lisa Echeverry, will support the program.

GRADUATE SCHOOL OF BIOMEDICAL SCIENCES

The most up-to-date contact information for the GSBS administration is on the GSBS Web site at: https://gsbs.uth.edu/directory/?ptype=staff

Dr. Sharon Dent as the Dean *ad interim* of the GSBS has the overall responsibility for leading the graduate school.

Drs. William Mattox and **Natalie Sirisaengtaksin** are the first stop for most academic matters affecting students. When you see references to the Office of Academic Affairs, it means Dr. Mattox and Dr. Sirisaengtaksin. **Lourdes (Bunny) Perez** is the GSBS liaison to the UTHealth Office of the Registrar and handles matters such as grades and records in the GSBS. **Dr. Mattox** and **Joy Lademora** oversee scholarships and fellowships. For the time being, Dr. Mattox and Joy also handle curricular matters. **Dr. Cherilynn Shadding** is responsible for diversity and student affairs.

Karen Weinberg will oversee admissions and the orientation of new students until a new admissions director joins the GSBS. She has recently assumed responsibility for the financial administration of the GSBS.

Lily D'Agostino manages the front desk. **A. Michael Valladolid** manages information technology with assistance from **Michael Orlando**.

Elisabet Lau assists GSBS-funded students with health benefits, payroll and other administrative matters related to financial support.

These are the people at the graduate school with whom students interact most frequently, but there are others as well, without whom the GSBS could not function. You will get to know them too as you become more familiar with the school.

There is a wealth of information that is relevant to students on this page: https://gsbs.uth.edu/academics/policies-and-procedures. Medical physics students are strongly encouraged to read all of the documents that are linked to from this page. If information in this handbook contradicts what is on the GSBS Web site, the GSBS is the more authoritative source, and the discrepancy should be brought to the program's attention for correction or explanation. Occasionally the program's policies and rules do differ from those of the rest of the GSBS with the knowledge and permission of the school.

There is a repository of GSBS forms here: https://gsbs.uth.edu/academics/forms. Students should take the responsibility to bring the required forms to their committee meetings and examinations. It is prudent to review the forms in advance and to complete as much of them as possible prior to the meeting, such as typing in the committee members' names.

DISCLOSURE OF NON-DISCRIMINATION

POLICY: It is the policy of The University of Texas MD Anderson Cancer Center ("Institution") to provide a learning and working environment that provides equal opportunity to all members of the MD Anderson community. In accordance with federal and state law, the Institution prohibits unlawful discrimination, including harassment, on the basis of race, color, religion, national origin, sex, pregnancy, age, disability, citizenship, veteran status, and genetic information or any other bases protected by applicable law.

Additionally, MD Anderson is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sex discrimination (including discrimination on the basis of pregnancy, sexual orientation, gender identity or gender expression), sexual harassment, sexual assault, sexual misconduct, interpersonal violence (including domestic violence and dating violence), and stalking will not be tolerated and will be subject to disciplinary action. MD Anderson policy also prohibits harassment of any applicant, workforce member, student, or any other person related to these bases. The Title IX of the Higher Education Act of 1972, as amended, requirement not to discriminate based on sex in the education program or activity extends to admission and employment.

Any person can report sexual discrimination, including sexual harassment in person, by mail, by telephone, by electronic mail, using the contact information listed for the Title IX Coordinator or by any other means that result in the Title IX Coordinator receiving the person’s verbal or written report. Such a report may be made at any time, including non-business hours by using the telephone number or electronic mail address or by mail to the office address listed for the Title IX Coord.

Further, all workforce members, applicants, students and program participants/beneficiaries will not be subjected to retaliation, reprisal, harassment, intimidation, threats, coercion or discrimination because they: (1) file a complaint with MD Anderson or government agencies; (2) assist or participate in any investigation, compliance review, hearing, or any other activity related to the administration of any law requiring equal opportunity; (3) oppose any act or practice made unlawful by any law requiring equal opportunity; or (4) exercise any employment right protected by Title VII of the Civils Rights Act of 1964, as amended, the Vietnam Era Veterans’ Readjustment Assistance Act of 1974, Section 503/504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act Amendments Act, or their implementing regulations.

All workforce members and students are responsible to act in accordance with MD Anderson’s Equal Opportunity policies and are encouraged to assist with MD Anderson’s affirmative efforts in support of its Equal Opportunity policies. All members of management must be familiar with these policies, must fully support them, and be responsible to apply these principles in good faith.

This statement is posted and distributed to give applicants, employees, trainees, students, and all interested others notice of MD Anderson’s commitment to ensuring equal opportunity and contact information for related resources throughout MD Anderson.

MD Anderson’s continuing Affirmative Action Program (AAP) exists to ensure equal employment opportunity in all policy decisions affecting recruitment, selection, assignment, promotion, training, and all other terms and conditions of employment.

Inquiries about the application of Title IX and 20 U.S.C. 1681 §106.8 may be referred to MD Anderson’s Title IX Coordinator, to the Assistant Secretary of Education, or both.

The Affirmative Action Plan for Disabled Workers and Covered Veterans is in the Office of Diversity & Inclusion and may be reviewed on weekdays during normal working hours in /accordance with applicable regulations.

RESOURCES FOR EACH OF THE AREAS REFERENCED IN THIS STATEMENT

Affirmative Action Coordination – employees	Larry D. Perkins, Ph.D., Associate Vice President, Talent and Diversity 713-745-0528
Disability Accommodation – employees and trainees	Celeste Dennis, Manager, Leave Center 5-myHR (713-745-6947) Karen Reed, Human Resources Specialist, Leave Center 5-*my*HR (713-745-6947)
Employee Assistance Program – employees and trainees	Mark Berg, Director, Employee Assistance Program 713-745-6905
Equal Opportunity, Sexual Misconduct Prevention, Title IX , Retaliation and Clery Coordinator – all workforce members and students	Sheri Wakefield, Title IX Coordinator, Director, EEO and HR Regulations 5-*my*HR (713-745-6947) Mid Campus Building 1 (1MC6.3216) 7007 Bertner Avenue, Unit 1612 Houston, Texas 77030 Email: sbrownlo@mdanderson.org eeogroup@mdanderson.org Website: MD Anderson Title IX Website Website: Campus Safety: Crime Statistics, Crime Reporting, https://www.mdanderson.org/campussafety

ADMINISTRATIVE INFORMATION

Lisa Echeverry is our Program Co-ordinator. She provides high-level administrative support to the first-year medical physics students and to more senior students as the need arises. She also maintains student personnel files, issues keys and ensures that students are in compliance with institutional policies and procedures.

Most students rely upon the support staff members (e.g., the Administrative Assistants) who support their supervisors for matters such as scheduling meeting rooms and processing travel and reimbursement requests. Most of the first-year students are supported in these matters by the Program Office.

Please note that many rules, policies, and procedures differ depending on whether a student is paid by the GSBS or by MD Anderson. As with any large bureaucracy, the consequences of getting things wrong can be substantial and difficult to repair. **When in doubt, don't guess; ask Lisa**.

FORMS AND PAPERWORK

Students will have to fill out many forms, either electronic or on paper, and have them signed by their advisors, committee members or the Program Director over the course of their educations. In many cases, the student or his or her advisor is responsible for submitting these to the GSBS. It is very important that a copy be sent to Lisa so that the student's file in the Program Office is up-to-date and complete.

TIME OFF REQUESTS

If a student needs to take time away for any reason, he or she should contact the Program Office. In most cases, the absence may be documented by filling out a simple form. The time away policies differ for GSBS-funded students and for MD Anderson-funded students. The Program Office will ensure that each student receives the correct advice for his or her needs and circumstances.

PAYCHECKS

Students are encouraged to sign up for direct deposit of their paychecks during orientation. Students are paid twice a month:

- GSBS-Funded Students – on the 1st and 16th of each month, pick-up at the Graduate School if not directly deposited
- MD Anderson-Funded Students – on the 5th and 20th of each month.

BADGES, KEYS AND PASSWORDS

The Program Office is responsible for distributing and collecting, and for reporting the loss or theft of:

- Radiation safety badges (i.e., dosimeters)
- Keys to office doors and furniture
- MD Anderson ID badges

The GSBS ID badge should be turned in to the Graduate School when finally checking out.

Most of the non-specialized computer systems that you will use at MD Anderson, including the approved cloud storage on OneDrive rely upon an Active Directory server that authenticates users by a single username, which will be assigned to you during the week of orientation. The password for that account may be changed using a feature call Password Self-Service. It must be changed at least quarterly. The accounts that are needed to access specialized computing systems that do not use Active Directory are managed in different ways that you will discover from faculty members or fellow students as your need to use them arises.

MAIL AND COMMUNICATIONS

Students have assigned mailboxes located in their office areas. All phone messages, supervisor communications and mail are placed in these boxes or transmitted via Email. Checking both Email and the physical mailbox once a day would be prudent.

Students should keep the Program Office apprised of any changes to their home residence addresses, home or cellular phone numbers and personal Email addresses, as well as student office room numbers and extensions. Students are encouraged to provide their cellular phone numbers. Situations do occasionally arise in which a student must be located and contacted quickly, and the accuracy of this information becomes essential. For example, in the disruption that was caused by Hurricane Harvey in 2017, the importance of being able to get in touch with students whose whereabouts and state of well-being were initially unknown was vividly demonstrated.

All GSBS students are also given Email addresses in the UTHealth domain, uth.tmc.edu. The GSBS uses these for official communication. Although the GSBS maintains a list of students' MD Anderson Email addresses and uses them for some purposes, the really important communications regarding registration, bursar's matters, benefits and insurance are sent only to students' uth.tmc.edu addresses. Students are strongly advised to check this account regularly, as they will be held responsible for having read in a timely manner the messages that are sent only to that address. More information on the UTHealth accounts and other information technology matters (including how to get cheap software) may be found here: https://gsbs.uth.edu/information-technology/. In particular, note the instructions for how to activate the UTHealth account and how to configure Email clients for more than one Email account.

Placing a long-distance telephone call requires a long-distance authorization code. Ask your supervisor for permission to use his or her authorization code, and then your supervisor's administrative assistant can place the call for you.

TRAVEL REQUESTS AND REIMBURSEMENT

In order to travel on official business related to your education or your project work (e.g., to visit another lab or to present at a regional or national meeting), a travel authorization request must be completed at least two weeks in advance of the start of the trip. The Program Co-ordinator will assign a support staff member to work with you on the completion of all travel arrangements. During the first year, this is generally the Program Co-ordinator. After that, it is generally a member of the support staff assigned to a student's research mentor. Please note:

- Follow the Rules – Certain aspects of traveling, most particularly air travel, must be booked through the MD Anderson travel department. MD Anderson **will not** reimburse travelers who reserve and pay for air travel themselves. Do not even think about it, no matter how good a deal you have found online. Really, do not. There is no reasoning against or exception made to this policy. Seek the assistance of the assigned support staff to make sure that all travel arrangements are made correctly.
- Confirm Travel Funding before Committing – The student is responsible for arranging with his or her supervisor how a trip will be funded before committing to the trip (such as by submitting an abstract to a conference). If a student is presenting papers, posters, or works-in-progress at national meetings, travel awards from the Graduate School are available via an application process, but these rarely cover all of the expenses of such a trip. The GSBS encourages students to apply for travel awards even before the submitted presentation has been accepted. The application form is on the GSBS Web site at https://gsbs.uth.edu/academics/forms.

- During and after Travel – Obtain itemized receipts for meals, hotels, taxi fares, shuttles, and other expenses and save them. If two students are splitting the cost of a room, have the hotel provide each student with an original bill for his or her portion of the hotel charges. Hotel bills must show a zero balance (i.e., the payment should be applied before the bill is printed). Alcohol will not be reimbursed. There is no *per diem* allocation; only actual expenses can be reimbursed. However, there are *per diem* limits on the reimbursable amount of various items such as lodging and meals. You will be apprised of the latest limits shortly before it is time to register and book the travel for major conferences. Other limits that depend on the funding source apply, and the support staff member can explain these intricacies. Not following these rules will cause substantial and possibly irremediable problems with reimbursement. Within three days of returning from the trip, provide the support staff member with all receipts and assist him or her in completing the travel reimbursement process.

Once the first-year students have been set up in the M. D. Anderson Human Resources system, they should log into Concur, which is a travel management application, and add Lisa Echeverry to their profiles. The login link can be found on this page: https://mdandersonorg.sharepoint.com/sites/accounts-payable-travel/SitePages/Concur-Travel-and-Expense.aspx. This will enable Lisa to handle the logistics of students' travel efficiently. To do so, click the stylized silhouette, choose Profile Settings and then Expense Delegates. Add Lisa's name and check the boxes for "Can Prepare", "Can Book Travel", "Can Submit Reports" "Can Submit Requests", and "Can Review Receipts." Do not wait until the last minute before a trip to do this. When a student signs on with an advisor, the advisor's support personnel should be added to Concur in the same way.

LABORATORY COATS

The Program Office provides each student with one lab coat. Students are responsible for the laundering of their lab coats, which must be kept clean and neat.

MEDICAL PHYSICS LIBRARY

The Department of Radiation Physics maintains a departmental library on the 8th floor of Pickens Academic Tower, FCT8.6053. The library is open on weekdays from 8:00 am to 5:00 pm. All books should be checked out and in through Melvina Kimble-Hackett, 713-563-2514, mkimball@mdanderson.org.

The Department of Imaging Physics maintains a departmental library in the Duncan Cancer Prevention Building just outside of the Imaging Physics Conference Room, CPB5.3374. The library is open from 8:00 am to 4:00 pm. All books and journals should be checked out and in through Nikki Franklin, 713-745-3841, CPB5.3331, nfranklin@mdanderson.org.

STUDENT COMPUTING RESOURCES

MD Anderson-issued laptop computers will be assigned to all students in the program. These are intended to be used both on-campus and when working remotely. They are configured so that they can access the internal MD Anderson network securely. All research work should be done on them or other institutionally-owned or sanctioned computers. Because they are the property of the State of Texas, personal use should be kept to a minimum if for no other reason than personal business could be discoverable under the Freedom of Information Act. Microsoft Office is among the software that is provided on these computers. Additional site-licensed software for institutional computers may be requested through the software self-service mechanisms that are installed on MD Anderson institutional computers.

Treatment planning computer inquiries should be addressed to Dana Garrison, Office Manager in Radiation Physics, by Email: dlgarrison@mdanderson.org. Please copy Lisa Echeverry, lecheverry@mdanderson.org on your request.

Desktop computer hardware inquiries should be addressed to 4-INFO via Email, 4info@mdanderson.org or by calling extension 4-4636 (4-INFO). IT support is shifting from the Email address to the portal here: https://4info.mdanderson.edu/CherwellPortal/IT2. Note the tiny link at the bottom of that page for logging in using the usual MD Anderson login credentials.

Software inquiries should be addressed to the Program Co-ordinator. Students who need **OneConnect or VPN access** should apply through the OneAccess mechanism, https://oneaccess.mdanderson.org/, after discussing their need with their advisors or, for first-year students, with the Program Director. The institution does not allow students to have full VPN access from computers that are not owned and managed by MD Anderson, but there is a mechanism by which to connect remotely to a variety of internal resources from a personally-owned computer through a virtual desktop environment called "vxremote". From vxremote, one can use the RDP utility to connect to a properly configured Windows computer. After receiving approval to use vxremote, one can connect to it via a Web browser at https://vxremote.mdanderson.org/ or by installing the VMWare Horizon Client for Macs or PCs.

The Program has several notebook computers that students may borrow for short-term use. These computers can be checked out for uses such as committee meetings, presentations, and gathering of data while working on research in clinical areas for later transfer to desktop computers. Please see Lisa to borrow one.

The University of Texas has a high-performance computing center, which is located in Austin, Texas: https://www.tacc.utexas.edu/. If you need to use this resource for your research, typically your advisor will know how to get you set up.

Computing in the cloud has become popular, but storing data remotely must be done securely in a medical environment. The inappropriate disclosure of protected health information, whether it be intentional or accidental, is dealt with very harshly by the federal government. The only approved cloud storage at MD Anderson is OneDrive, which is integrated into the MD Anderson Windows computing environment.

MD Anderson regularly evaluates other remote storage services, but at present, only OneDrive is approved for the storage of confidential information. Some of the services that are not approved have actually been found to be malicious. Do not be surprised to find your access to other cloud storage blocked. Do not place confidential information, especially patient data, on any remote storage service that is not approved. This includes putting patient information, such as a spreadsheet of research data, in an Email message that is sent outside of MD Anderson and embedding a graph in a PowerPoint presentation in a manner that also embeds all of the underlying data and then sending that PowerPoint file outside of the institution. If an issue arises, such as external collaborators who insist on using a service that is not approved, discuss the situation with your advisor and the Program Director. MD Anderson monitors the flows of information into and out of the institution in real time, and it takes violations of this policy very seriously.

MD Anderson is strengthening its **information security** measures. Its information security policies include not being able to connect personally-owned computers to the MD Anderson internal network, requiring that all research be performed on MD Anderson-owned computers, and the blocking of the use of removable storage (such as USB flash drives). These are strict measures that will adversely affect how many of us have been accustomed to working, but they are necessary in light of clear and persistent threats to the institution from malware, ransomware and intellectual property thieves as well as the serious consequences that the institution has already faced from the accidental loss of unencrypted data storage devices with sensitive contents.

The institution states that users of computing systems should have no expectation of privacy. This is a nice way of saying that the use of computing resources is actively monitored. Also, MD Anderson is part of The University of Texas System and a State agency, so much of what you say and do with institutional resources could be made public through Texas Public Information Act requests. Don't do anything on an institutional computer or the institutional network that you would not be proud of.

Please take data security and patient privacy seriously. These are real concerns, and we have in the past had students get in trouble with the institution for not following the rules.

COPYRIGHTED MATERIALS

The proper use of copyrighted materials, including photocopying, scanning and incorporating into other works, is governed by federal law and by institutional policies. The MD Anderson policy on copyrighted materials, http://inside.mdanderson.org/institutionalpolicy/ADM0338, lays out a number of issues of which students should be aware so that they properly respect the rights of others. NB: The Safari browser does not work for the viewing of institutional policies without setting its User Agent to Chrome or Firefox.

AAPM DUES

All Medical Physics Program students are expected to belong to the American Association of Physicists in Medicine. The Medical Physics Program will reimburse students for the initiation fee and the annual dues for student membership in the AAPM. In order to receive reimbursement, please provide Lisa with proof of payment.

CHECKING-OUT OF YOUR DEPARTMENT AND/OR MD ANDERSON

When you are ready to leave your department, e.g., when you graduate, check with the Program Office to find out what you need to do. Students must notify the Program Office at (713)563-2548 as soon as possible of their last working day at MD Anderson. This really needs to be done at least two weeks in advance of your last day. The Program Office will then refer you to the appropriate staff members at the GSBS and at the Office of Research Training Programs (RTP). All departing students will be referred by RTP to the online clearance form to be completed and signed by the departments listed on the form, e.g. the medical library, payroll, etc. The checkout process is complete only after a student has been cleared by all departments that are required on the clearance form and has returned the completed clearance form and his or her ID badge to the Program Office.

CHECKING-OUT WITH THE MEDICAL PHYSICS PROGRAM OFFICE

After you have completed your degree, please give Lisa your forwarding information, including your next position, Email address and mailing address. Among other reasons for asking for this information, the Program's accreditation by CAMPEP requires that we provide them with an annual summary of the success and future plans of our graduates.

A member of the Program Office will be the last person to sign your RTP exit paperwork. At that time, your badge and keys will be collected. The exit paperwork will be forwarded to RTP on your behalf.

FINANCIAL EMERGENCIES

The Graduate School has a program whereby students who are US citizens or permanent residents may borrow as much as $1000 for as long as 90 days and pay no interest. This could come in handy in situations such as the delayed reimbursement of travel expenses (e.g., a hotel room) that a student has incurred in order to attend a conference. Applications for loans will be processed on the same day if they are received before 3:00 pm and on the next day otherwise. The link to the loan information is here: https://www.uth.edu/sfs/financial-aid/emergency-loans.htm. Foreign students should inquire about their loan options at the International Office.

WIDESPREAD EMERGENCIES

Houston is a city on a coastal plain that is subject to flooding during heavy rains, tropical storms and hurricanes. Usually, there is enough warning before a hurricane arrives that researchers can secure their experiments and backup their data, but severe flooding from a heavy rain storm can sometimes occur with little or no advanced notice and leave people isolated if not in physical danger for hours to days.

In such emergencies, the Program's parent institutions, UTHealth and MD Anderson, must give their highest priority to the patients and a pared-down staff (which is called the Ride-Out Team at MD Anderson) that remains onsite. Students should monitor the institutions' emergency status at https://emergencyalert.mdanderson.org/, and https://uthealthemergency.org/. They should consider signing up for emergency alerts that are delivered via Email or text messages. Students should not come to campus during such emergencies, even once the streets become passable again, unless they are specifically authorized to do so. The institutions' resources, including food, water, sewer capacity and electricity from emergency generators might be limited and needed for essential operations such as patient care and the protection and repair of the physical plant.

Students should heed the advice in the news media prior to hurricanes regarding storm preparation and evacuation. The institutions cannot act as a safe haven and will not allow "non-essential" personnel, including students, into their facilities during an emergency. To be blunt, students will be on their own regarding their personal safety, just as the rest of Houston will be.

After an emergency has passed, students might find themselves needing to move and to replace damaged possessions, perhaps even including an automobile. The Graduate School has an interest-free loan mechanism to help students recover. In some past incidents, the parent institutions have also had means to help, such as fund drives that have included students among their beneficiaries.

Neither renter's insurance nor home-owner's insurance typically includes flood coverage. However, insurance against flooding can be purchased separately. Historically, the Program has had more students' homes affected by flooding than by fire or burglary. When choosing a place to live, one might consider the advantages of living higher than the ground floor in a multi-story building.

SPECIAL NEED REQUIRING AN ACCOMMODATION

The following is adapted with only slight modification from the GSBS policy on student disability (https://gsbs.uth.edu/current-students/student-life.htm#panel1-6be76834-52ce-41bc-897f-78be341c76b8):

A student seeking accommodations must initiate a request in writing to the school's Section 504 Coordinator as soon as practical. This typically occurs during the first semester of enrollment or following a new diagnosis. The 504 Coordinator will meet with the student to acknowledge the request, gather information, and explain the process. The student will complete the Request for Accommodations, and also submit the Medical Inquiry Form completed by his or her doctor or other medical professional, where appropriate. The 504 Coordinator reviews these documents with the UTHealth EEO Coordinator resulting in the Reasonable Accommodations Response Form. Once received by the student, it is up to him or her to share the Accommodations Response Form with faculty and instructors well in advance of requesting accommodations in any classes. This information remains confidential and does not become part of a student's academic record.

A student should not request accommodations directly from a faculty member. If that occurs, the faculty member should refer the student to the school's Section 504 Coordinator and/or the GSBS policy. Faculty should not be routinely granting extra time or other accommodations to students who may claim, without providing the Accommodations Response Form, that they have a disability; rather, that documentation is required.

Students who have a special need must formally request an accommodation through the GSBS Section 504 Co-ordinators. The GSBS has two Section 504 Coordinators: **Natalie Sirisaengtaksin**, for academic accommodations (Natalie.Sirisaengtaksin@uth.tmc.edu; **713-500-9870**); and **Cheryl Spitzenberger**, for facilities-related accommodations (Cheryl.A.Spitzenberger@uth.tmc.edu**; 713-500-9875**).

REPORTING SEXUAL MISCONDUCT

While we hope that our students are never subjected to sexual harassment, should it occur there is a State law, called Senate Bill 212 that all students should be aware of. It might affect how the subject of such harassment would choose to report it, and it definitely affects how anyone who witnesses or is informed of such harassment must report it. The law actually applies to a wide spectrum of what is now being called sexual misconduct, which includes both assault and harassment of a sexual nature, as well as stalking and dating violence.

The law is complicated, and what follows is a summary that does not go into every detail. MD Anderson and UTHealth interpret the law differently as to the definition of "student". This affects the mandatory reporting requirement under the law. Since all of the Medical Physics students at the moment are affiliated in some fashion or other with MD Anderson, all should follow the guidance of MD Anderson.

MD Anderson currently considers Graduate Research Assistants to be workforce members for the purpose of this law. All employees (including MD Anderson-affiliated graduate students) have a mandatory reporting obligation. Only the victim of an incident is not obliged to report it, although filing a report is encouraged. Under the law, the failure of anyone but the victim to report an incident could lead to dismissal and criminal prosecution. This could have an adverse effect upon a student's education.

There are two places where a workforce member at MD Anderson who is the subject of sexual misconduct may discuss a concern confidentially – the Employee Assistance Program and the Department of Spiritual Care and Education, which was formerly called the Chaplaincy Service. *If anyone else at MD Anderson, even your best friend in whom you had confided, observes or learns of the incident of sexual misconduct, he or she must report it*.

Reports may be made at any time, including non-business hours. They should be made to the Title IX Office, Title IX Co-ordinator, Sheri Wakefield, sbrownlo@mdanderson.org, 713-745-6174. The office location is 1 Midcampus Building, 6th Floor, Room 3216 (1MC6.3216), 7007 Bertner Avenue, Houston, Texas 77030 or https://www.mdanderson.org/campussafety/. Reports must be made promptly, and they must be made by every witness and person who becomes aware of a situation. For example, if someone were to make an off-color comment of a sexual nature at a work-related event and that comment were to make even one person uncomfortable, everyone who observed or became aware that someone felt uncomfortable or sexually harassed by the sexual nature of the comment, and everyone who is later told about the comment, must report it to the Title IX Office or risk being fired.

There is an MD Anderson policy on the matter here: http://inside.mdanderson.org/institutionalpolicy/ADM0285 .

The advice of MD Anderson is to report anything and everything and to let Ms. Wakefield's office investigate it. It is better to report something that is later deemed not to be sexual misconduct than it is not to report something that is later determined to have been mandatorily reportable.

SOCIAL MEDIA

The use of so-called social media has become ubiquitous. They are a great way to further your academic career if they are used strategically. Both the GSBS and MD Anderson encourage appropriate use for such purposes. Please note the social media policy (http://inside.mdanderson.org/institutionalpolicy/ADM1112) and guidelines (https://inside.mdanderson.org/departments/communications/faculty-digital-toolkit.html) for how to use them appropriately and constructively. Your conduct will reflect not only on yourself, but also on the GSBS and on MD Anderson. In particular, be careful not to discuss patient information or to disclose research that is not yet ready to be made public.

PROGRAM EVENTS AND ACTIVITIES

Until the resolution of the COVID-19 pandemic, many of the activities below are likely to be postponed or held virtually.

MEDICAL PHYSICS PROGRAM ORIENTATION

The incoming Medical Physics Program students participate in portions of the week-long GSBS orientation. A special program consisting of an introduction to computing; laboratory, linac, and radiation safety training; an introduction to the research areas in medical physics; and an administrative orientation is presented to the medical physics matriculants during the rest of the GSBS orientation week.

STUDENT LUNCHEONS

The Medical Physics Program Student Council holds a couple of luncheon meetings each year. The purpose of these luncheons is to provide a venue for students to bring up issues or concerns as needed.

LUNCH WITH THE PROGRAM DIRECTOR AND THE DEPUTY DIRECTOR

Twice yearly, the Program Director and the Deputy Program Director will meet with the student body over lunch in order to bring students up to date on recent GSBS or program changes and to discuss issues or concerns.

JOINT MEETING OF THE STUDENTS AND FACULTY

Each spring, the Medical Physics Program students and faculty meet together to discuss business of mutual interest. An example was the presentation to the faculty of the report of the *ad hoc* Student Curriculum Committee, which led to the curriculum revision that was introduced for the entering class of 2017.

THESIS DEFENSE SEMINARS

All Medical Physics students are strongly encouraged to attend the M.S. and Ph.D. defense seminars of all Medical Physics students. This is a chance to support fellow classmates and to observe how to present and defend a thesis or dissertation successfully.

DEPARTMENTAL SEMINARS

The Departments of Imaging Physics and Radiation Physics host seminars throughout the year. Internationally recognized experts come to speak and to present their latest results. All Medical Physics program students are very strongly encouraged to attend these seminars. Either department might require that its students attend a particular event. Students will be notified when their attendance is mandatory.

DEPARTMENTS OF IMAGING PHYSICS AND RADIATION PHYSICS ALUMNI EVENT

During the Annual Meeting of the American Association of Physicists in Medicine, the Departments of Imaging Physics and Radiation Physics host an event for all alumni, current program students, faculty and staff. This is an opportunity to participate in the continuity of the program and to make professional contacts with alumni and friends of the program.

PROGRAM SEMINARS AND EVENTS

The Medical Physics Summer Student Research Seminar is a summer-long series of research presentations by students in medical physics. All medical physics graduate students are expected to attend each week and to present when called upon to do so. The presentations are typically 15 minutes long and describe either a project that a student has worked on or the student's ongoing thesis or dissertation work.

STUDENT RESEARCH RETREAT

The student body organizes a retreat each year at which the students discuss their research under the guidance of a distinguished medical physicist from another institution. The program faculty members do not participate in this event by design; it is by students and for students.

ADVICE FOR BOTH S.M.S. AND PH.D. STUDENTS AND SOME FOR CERTIFICATE STUDENTS

WAIVING A REQUIRED COURSE

Students who wish to waive a required course in the medical physics curriculum may do so with the approval of both their advisor and the appropriate course coordinator, but only if the course coordinator determines that the education that the student had received previously is equivalent to the medical physics course to be waived. The program is co-ordinating the waiver process so that the outcomes are more predictable and timely. The details may be obtained from the Program Office. A course waiver should be requested well in advance of the beginning of the semester in which the course that is to be waived is offered. This will allow ample time for review and processing. After the course co-ordinator grants a waiver, the Program Steering Committee reviews the waiver and ratifies it. As a general rule, the student should have received a grade of B or better in any course that is offered in support of a waiver request.

NB: If a student registers for a course and then receives a waiver of that course, *he or she must explicitly drop the course*. That will not be done automatically as part of the waiver process. Not dropping the waived course can lead to an unwelcome surprise at the end of the semester, such as a failing grade, that is almost impossible to fix at that point.

Also, note that a waiver does not confer transfer credits and thus extra electives (or more hours of research) might be required in order to fulfill the GSBS requirement regarding the minimum number of credit hours for the degree.

INTER-INSTITUTIONAL ENROLLMENT

Students who are enrolled in the GSBS may take courses in several other components of The University of Texas System, at Texas Woman's University and at the Gulf Coast Consortium institutions, which include Rice University, the University of Houston, and Baylor College of Medicine among others. Courses at Rice University are especially popular among Medical Physics students. The details of how to register correctly vary among the institutions, so be sure to consult the appropriate link on this page: https://www.uth.edu/registrar/current-students/student-information/concurrent-enrollment.htm when planning to take such a course. We have had a student be presented with a large and unexpected tuition bill when the proper procedure had not been followed.

COMMITTEE MEETINGS

All GSBS students are required to meet with their advisory committees at least twice a year, usually at six-month intervals. However, the program strongly encourages more frequent meetings. A detailed description of the different committee meetings, how to set them up, how to prepare, what to bring, what to expect, etc. is in the subsequent "Committees" section (page 40).

All medical physics students should form their Advisory Committees no later than the summer semester of their first year. The purpose of the first advisory committee meeting is to meet everyone on the committee, discuss coursework, and get feedback on possible experimental approaches, interpretations, and goals. Do not delay setting up the first Advisory Committee meeting. The student need not present extensive results at this first meeting. The goal of the first meeting is to get advice that will help the student to plan his or her work.

THESES AND DISSERTATIONS

The thesis for the master's degree and the dissertation for the Ph.D. degree are extensive reports of a student's research work. They typically include the traditional elements of a scientific manuscript: the background of the project, a statement of the hypothesis or design premise and of the specific aims of the work, the materials and methods that were employed, the results that were discovered or measured, the significance and interpretation of those results and the conclusion as to the validity of the hypothesis or the success of the design. However, they include much more detail and information than is possible to fit into a journal article. It is not uncommon also to discuss how the work might be carried further in the future. These future directions could be a valuable inspiration to more junior students who are seeking a research topic. The GSBS publishes theses and dissertations online at: http://digitalcommons.library.tmc.edu/utgsbs_dissertations/. It should probably be noted that the graduate school and the agencies that fund fellowships are accustomed to hypothesis-driven research, which is not how all medical physics research is conducted, but one can often formulate a hypothesis about the effectiveness of the design and implementation of a design-driven project.

The version of the thesis or dissertation that the student will defend must be prepared more than two weeks prior to the defense so that the student's committee can approve it at least two weeks in advance as required by the GSBS. Both an electronic copy and a printed copy are to be submitted to the GSBS with the Request for Defense form, which must be signed by all of the committee members. A copy, preferably electronic, must also be submitted to the Program Office at least a day before the defense. That copy will be made available to any faculty member who wishes to read the thesis or dissertation prior to or after the defense.

The final version of the thesis or dissertation must conform to the style guidance of the GSBS, which can be found here:
https://gsbs.uth.edu/academics/assets/forms/Template%20for%20the%20Thesis%20or%20Dissertation.docx. Following these rules from the start of writing will save the anguish of corrections at the very end when time will be at a premium.

Almost without exception, students underestimate how long it will take to write the thesis or dissertation. Do not procrastinate. In an ideal world, the student would complete all experiments and data analysis at least a semester before graduation and do nothing but write and defend during that last semester. Actually writing up the work might reveal the need for some last-minute experimental or analytical work, for which there would then be time. Students who are not facile in written English should allow extra time both for the writing itself and for someone who is a better writer to proofread and correct a relatively mature draft. A thorough editing of a document of this length can take a week or two. Do not subject your committee members to a poorly written draft.

PUBLICATION

Scholarly work is typically reported to the scientific community in the form of peer-reviewed papers, often after having been presented orally or as a poster at a conference. The paper is typically far shorter and more succinct than a thesis or dissertation. Sometimes several papers may arise from the work that is reported in the thesis or dissertation. For many students, a manuscript might be written at the completion of each significant intermediate milestone of their projects. These might then be combined and expanded to form much of the thesis or dissertation. The student's advisor and committee will offer guidance as to whether or not this is a suitable strategy and, if it is, how to approach it.

It is important to supporting the reputation of the graduate school for students to include their GSBS affiliation when they write papers and present their work at conferences. One way to do this might be with the words "from the Department of Radiation Physics or the Department of Imaging Physics, as the case may be, The University of

Texas MD Anderson Cancer Center, and the Graduate Program in Medical Physics, The University of Texas MD Anderson Cancer Center UTHealth Houston Graduate School of Biomedical Sciences." Students should also consider using the GSBS logo and template for their posters. See https://gsbs.uth.edu/about/logo-downloads.

Except for Ph.D. students who join the program after having earned a thesis-based master's degree, one first-authored manuscript that has been submitted to an appropriate peer-reviewed journal is expected at the master's level (be it the S.M.S., the M.S. *en route* to the Ph.D., or the M.S. bypass by publication). For all Ph.D. students, a first-authored paper that was written after advancing to candidacy is expected at the doctoral level. In many cases, a student's advisor and committee will have a higher expectation. The Graduate School requires that at least one of a Ph.D. student's papers must have been accepted by, and not just submitted to, a journal by the time of the student's defense. This rule had been relaxed slightly during the pandemic, but has now been restored.

CHANGING ADVISORS

It is rare, but not unheard of, for a student to change advisors. The Graduate School is developing a more formal policy, but in the meantime, should the need arise, the best thing to do is to discuss the matter with the Program Director and the Office of Academic Affairs, who will guide the student (and the two affected faculty members) through the process. Such a change requires the approval of the Academic Standards Committee of the GSBS because it would entail the submission of a revised Advisory Committee form. The student and his or her new advisor will also have to execute the Accountable Mentorship Agreement.

TAKING A LEAVE OF ABSENCE

From the "Policies and Procedures/Leave of Absence" section of the GSBS website (https://gsbs.uth.edu/academics/policies-and-procedures#panel6-570b6770-7a76-40fe-941f-aba1a326bc72):

> The GSBS allows students to request an official Leave of Absence (LOA) for up to one year. During an official LOA, the student cannot be paid by the advisor or the GSBS as a student, but the student may work at outside employment. Students may request an official LOA from the Office of Academic Affairs at the GSBS. Students must state a date when they will return to the GSBS. If they do not return by that date, and they have not been granted an extension of the LOA, they will be considered to have withdrawn from the GSBS. Students funded by GSBS are funded for the specified term for continuous enrollment. If a student takes a LOA during the time funded by GSBS, no guarantee can be made that the GSBS-funded time lost during the LOA can be "re-captured" once the student returns to their studies.
>
> Students may return prior to the date indicated on the LOA form. Students returning from LOA do not need to re-enter the Admissions process, but they must notify the Office of Academic Affairs that they are returning at least 30 days prior to the first day of class of the semester in which they wish to re-enroll. Extensions of the official LOA for a maximum of up to one additional year may be requested through the Office of Academic Affairs and must have the approval of the Dean of the Graduate School. Requests for extensions must be submitted at least 30 days before the end of the initial leave.
>
> In cases where a student on leave of absence has separated from the thesis/dissertation advisor, the student must identify a faculty member who is willing to serve as the new thesis/dissertation advisor prior to the student's re-enrollment in the GSBS. The new advisor and a plan for completing the thesis/dissertation must also be approved by the GSBS Academic Standards Committee.
>
> In cases where a student is returning from a leave of absence that was initiated after, or coincident with, being placed on academic probation, the student must submit a plan for remedying the academic issue

and completing the degree program at least 60 days prior to returning to the GSBS. This plan must be approved by the Academic Standards Committee before the student may enroll again.

An official LOA request petition must be filled out by the student and turned into the Office of Academic Affairs. As a part of this form, numerous signatures are required from various offices around the Texas Medical Center, indicating that the appropriate institutional individuals and offices approve the request for a LOA with non-registered status.

Note that any student who fails to register for any semester and who has not been granted an official leave of absence or been approved as a non-registered candidate for a degree will be considered to have withdrawn from GSBS. Once having withdrawn, a student who wishes to continue formal studies must apply and be readmitted to GSBS.

TIME AWAY FROM THE LAB

Students receive their stipends as employees of one of the GSBS parent institutions, each of which has their own employment policies and procedures with which the student must comply. UTHealth and MDACC each have their own policies on several issues, such as the amount of time graduate students are permitted to be away from their lab or workplace for purposes such as sick leave, vacation, family-related leave, etc. The GSBS policy on time away from the lab is deferred to the policy of the institution at which the student is employed. When a student joins the lab/group of a faculty member, the student should apprise him/herself of these policies. In all cases, however, the students should remember that he/she is employed by the advisor, and the advisor sets the standards for work ethic and policies of the lab, including attendance standards and expectations. The student and advisor should always explicitly discuss the advisor's expectations before they make a mutual commitment. In all cases, it is the student's responsibility to request time away from the lab (or expected lab activities; in advance, when possible) and to keep the advisor, or the advisor's designee, informed in a timely manner of any unanticipated absences, e.g., for illness, family emergencies, etc.

Students who wish to discuss a leave of absence and/or obtain the form and instructions to request a leave should contact the GSBS Associate Dean of Academic Affairs.

THE AMERICAN BOARD OF RADIOLOGY CERTIFICATION EXAMINATION, PART 1

For medical physics students who wish someday to become Qualified Medical Physicists, certification by the American Board of Radiology is for all practical purposes a requirement (although Canadians have the option of the Canadian College of Physicists in Medicine, and there are some specialty boards that certify in narrow areas). The ABR certification examination is in three parts, roughly corresponding to graduate school, residency and initial work experience. Part 1 is an examination on the general and clinical knowledge that a second-year graduate student would be expected to have. The ABR is in the midst of a number of changes to the examinations, so the latest information should be sought from their Web site, https://www.theabr.org/. Strategically, the passing of ABR Part 1 is considered to confer an advantage in competing for residency positions and thus our S.M.S. students have endeavored to take it at the first opportunity. In the past, this was prior to their having taken Med Phys IV or the Anatomy, Physiology and Biology classes. As a consequence, they have had to study extra hard. This is another reason why the program encourages S.M.S. students to take 2-1/2 to 3 years rather than to try to get done during the second summer. Ph.D. students have more time and typically can wait until after they have completed all of the required courses. While some Ph.D. students wait several years, it might be more efficient to take Part 1 while the subject matter of the courses is still relatively fresh in one’s mind.

INTEGRITY OF A STUDENT'S WORK

Different professors take different approaches to assignments and examinations regarding whether or not students may work together and whether or not reference materials are allowed. Students should assume that, by default, all work is to be a student's original, independent, personal, unaided work unless permission has been given in advance that a team effort is acceptable (e.g., for a group lab report) or that reference materials may be consulted (e.g., for an "open book" examination). If there is any doubt as to the ground rules of an assignment or examination, assume original, independent, personal, unaided work until the rules have been clarified. Of course, any allowed use of the work of others should be properly attributed and not represented to be the student's own work (i.e., avoid plagiarism).

THE CURRICULUM

The Program revised the curriculum in 2017 and then refined it further for the entering classes starting in August, 2021 and subsequently. Students who matriculated prior to August, 2017 should follow the pre-2017 curriculum. The pre-2017 curriculum is discussed only for PhD students, since there are no longer any current S.M.S. students who matriculated under that curriculum.

THE SPECIALIZED MASTER OF SCIENCE IN MEDICAL PHYSICS

COURSEWORK FOR THE S.M.S. IN THE 2021 CURRICULUM

The S.M.S. student must complete a minimum of 42 semester credit hours of didactic coursework, including 40 hours of required courses, one hour of electives and at least one hour of thesis.

Required Courses		Hours
GS02-1052	Imaging Science	2
GS02-1072	Statistics for Medical Physicists	2
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
GS02-1103	Introduction to Medical Physics II: Medical Imaging Physics	3
GS02-1113	Introduction to Medical Physics III: Therapy Physics	3
GS02-1193	Introduction to Medical Physics IV: Nuclear Medicine Physics	3
GS02-1213	Therapy Medical Physics II	3
GS02-1223	Diagnostic Medical Physics II	3
GS02-1202	Electronics for Medical Physicists	2
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
GS02-1133	Introduction to Radiation Protection	3
GS02-1063	Fundamental Anatomy, Physiology and Biology for Medical Physics I	3
GS02-1073	Fundamental Anatomy, Physiology and Biology for Medical Physics II	3
GS02-1731	Medical Physics Seminar	1 × 3
GS21-1051	The Ethical Dimensions of the Biomedical Sciences	1

Possible Elective Courses		Hours
GS01-1033	Introduction to Biostatistics and Bioinformatics	3
GS02-1022	Special Radiation Treatment Procedures	2
GS00-1610	Special Project Course: Radiation Transport Methods	2
GS00-1610	Special Project Course: Volumetric Image Reconstruction	2
GS00-1610	Special Project Course: Digital Signal Processing for Medical Physicists	2
GS00-1610	Special Project Course: Digital Image Processing for Medical Physicists	2
GS00-1610	Special Project Course: Grant Writing	1
GS02-1032	Principles of Magnetic Resonance Imaging	2
GS02-1012	Physics of Positron Emission Tomography	2
GS02-1011	Radiation-Induced Late Effects and Survivorship Journal Club	1
GS02-1083	Biological and Biophysical Principles of Molecular Imaging	3
GS02-1021	Supervised Clinical Experience in Radiation Therapy Physics	1
GS02-1031	Supervised Clinical Experience in Imaging Physics	1
	Other electives within the GSBS or at neighboring institutions	

TYPICAL S.M.S. ACADEMIC PLAN UNDER THE 2021 CURRICULUM

Note that this academic plan envisions a time of 2-1/2 to 3 years to complete the program, with the third year devoted to electives and thesis hours. This relieves the compression that S.M.S. students experienced in the past when they were trying to begin a residency in the second July after starting the S.M.S. program.

Year 1, Fall Semester		**Hours**
GS02-1052	Imaging Science	2
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
GS02-1202	Electronics for Medical Physicists	2
GS02-1731	Medical Physics Seminar	1
GS21-1051	The Ethical Dimensions of the Biomedical Sciences	1
	Total	9

Year 1, Spring Semester		**Hours**
GS02-1103	Introduction to Medical Physics II: Medical Imaging Physics	3
GS02-1113	Introduction to Medical Physics III: Therapy Physics	3
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
GS02-1731	Medical Physics Seminar	1
	Total	10

***** Deadline for Forming the Advisory Committee *****

Year 1, Summer Semester		**Hours**
GS02-1213	Therapy Medical Physics II	3
GS02-1223	Diagnostic Medical Physics II	3
GS00-1520	Research in Biomedical Sciences	0-2
	Electives	0-2
	Total	6-8

***** Goal for Petitioning to Candidacy for the M.S. Degree *****

Year 2, Fall Semester		**Hours**
GS02-1193	Introduction to Medical Physics IV: Nuclear Medicine Physics	3
GS00-1910	Thesis for Master of Science	3
GS02-1072	Statistics for Medical Physicists	2
GS02-1063	Fundamental Anatomy, Physiology and Biology for Medical Physics I	3
GS02-1731	Medical Physics Seminar	1
	Total	12

Year 2, Spring Semester		**Hours**
GS02-1073	Fundamental Anatomy, Physiology and Biology for Medical Physics II	3
GS00-1910	Thesis for Master of Science (after candidacy is approved)	3-6
	Electives	0-3
	Total	9

Year 2, Summer Semester		**Hours**
GS02-1133	Introduction to Radiation Protection	3
GS00-1910	Thesis for Master of Science	0-3

	Electives		0-3
		Total	6

Year 3, Fall Semester			**Hours**
GS00-1910	Thesis for Master of Science		9
		Total	9

Year 3, Spring Semester			**Hours**
GS00-1910	Thesis for Master of Science		9
		Total	9

COURSEWORK FOR THE S.M.S. IN THE 2017 CURRICULUM

The S.M.S. student must complete a minimum of 41 semester credit hours of didactic coursework, including 39 hours of required courses, two hours of electives and at least two hours of thesis for a minimum of 43 hours.

Required Courses		**Hours**
GS02-1052	Imaging Science	2
GS02-1072	Statistics for Medical Physicists	2
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
GS02-1104	Introduction to Medical Physics II: Medical Imaging	4
GS02-1114	Introduction to Medical Physics III: Therapy	4
GS02-1194	Introduction to Medical Physics IV: Nuclear Medicine	4
GS02-1202	Electronics for Medical Physicists	2
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
GS02-1062	Introduction to Clinical Medical Physics	2
GS02-1133	Introduction to Radiation Protection	3
GS02-1063	Fundamental Anatomy, Physiology and Biology for Medical Physics I	3
GS02-1073	Fundamental Anatomy, Physiology and Biology for Medical Physics II	3
GS02-1731	Medical Physics Seminar	1 × 3
GS21-1051	The Ethical Dimensions of the Biomedical Sciences	1

Possible Elective Courses		**Hours**
GS01-1033	Introduction to Biostatistics and Bioinformatics	3
GS02-1022	Special Radiation Treatment Procedures	2
GS00-1610	Special Project Course: Radiation Transport Methods	2
GS00-1610	Special Project Course: Volumetric Image Reconstruction	2
GS00-1610	Special Project Course: Digital Signal Processing for Medical Physicists	2
GS00-1610	Special Project Course: Digital Image Processing for Medical Physicists	2
GS00-1610	Special Project Course: Grant Writing	1
GS02-1032	Principles of Magnetic Resonance Imaging	2
GS02-1012	Physics of Positron Emission Tomography	2
GS02-1011	Radiation-Induced Late Effects and Survivorship Journal Club	1
GS02-1083	Biological and Biophysical Principles of Molecular Imaging	3
	Other electives within the GSBS or at neighboring institutions	

COURSE DESCRIPTIONS

The descriptions of these courses may be found on the GSBS Web site through links at: https://gsbs.uth.edu/medphys/program-requirements S.M.S. students should note carefully the requirement of at least one or two hours of electives and plan their course of study accordingly. For those planning to start a residency in the second summer after joining the S.M.S. program, the best time to take an elective might be in their first summer rather than waiting, as medical physics elective courses tend to be offered in the summer. Students who intend to finish by June of their second year should plan carefully as they might not be able to take any courses in their second summer term, but be able to register only for thesis hours.

TYPICAL S.M.S. ACADEMIC PLAN IN THE 2017 CURRICULUM

Year 1, Fall Semester			**Hours**
GS02-1052	Imaging Science		2
GS02-1093	Introduction to Medical Physics I: Basic Interactions		3
GS02-1202	Electronics for Medical Physicists		2
GS02-1062	Introduction to Clinical Medical Physics		2
GS02-1731	Medical Physics Seminar		1
GS21-1051	The Ethical Dimensions of the Biomedical Sciences		1
		Total	11

Year 1, Spring Semester			**Hours**
GS02-1104	Introduction to Medical Physics II: Medical Imaging		4
GS02-1114	Introduction to Medical Physics III: Therapy		4
GS02-1053	Radiation Detection, Instrumentation and Data Analysis		3
GS02-1731	Medical Physics Seminar		1
		Total	12

***** Deadline for Forming the Advisory Committee *****

Year 1, Summer Semester			**Hours**
GS00-1520	Research in Biomedical Sciences		3-6
	Electives		0-3
GS02-1133	Introduction to Radiation Protection		3
		Total	6-9

***** Goal for Petitioning to Candidacy for the M.S. Degree *****

Year 2, Fall Semester			**Hours**
GS02-1194	Introduction to Medical Physics IV: Nuclear Medicine		4
GS00-1910	Thesis for Master of Science		3
GS02-1072	Statistics for Medical Physicists		2
GS02-1063	Fundamental Anatomy, Physiology and Biology for Medical Physics I		3
GS02-1731	Medical Physics Seminar		1
		Total	13

Year 2, Spring Semester			**Hours**
GS02-1073	Fundamental Anatomy, Physiology and Biology for Medical Physics II		3
GS00-1910	Thesis for Master of Science (after candidacy is approved)		6-9
	Electives		0-3
		Total	9-12

Year 2, Summer Semester			Hours
GS00-1910	Thesis for Master of Science		3-6
	Electives		0-3
		Total	6

This academic plan is very aggressive, and it requires that every aspect of the student's research be accomplished at the fastest possible pace. The program recommends that S.M.S. students plan to take two and one-half to three years so that they can do a more extensive research project and have the time to write it up with the greatest care and thoroughness.

S.M.S. THESIS

A thesis that is of a sufficiently high quality for publication of the work in a refereed journal is required. The student must register for thesis credit for at least one semester. The student is admitted to candidacy upon the GSBS Academic Standards Committee's determining that the planned program of coursework, the abstract of the proposed research, and the proposed members of the Advisory Committee meet the GSBS standards. The student must be admitted to candidacy before receiving credit for the first semester of Thesis. Prior to admission to candidacy, the student should register for Research in Biomedical Sciences for research hours.

The S.M.S. thesis is considered to be complete after the delivery of a public seminar, the successful passing of an oral examination on the thesis by members of the Advisory Committee and other interested faculty, and the signing by all members of the student's Advisory Committee of the final written version of the thesis.

Prior to completing all of the degree requirements, the student is expected to prepare at least one manuscript based on the thesis work and to submit it for publication in an appropriate peer-reviewed scientific journal. Students are strongly encouraged to get this done while they are in the program. The demands of a residency or a job make it extremely difficult to write the manuscript after leaving the program, especially when the student's familiarity with the material is waning and access to the resources that supported the project might be restricted or cut off entirely.

Guidance from the GSBS is available here https://gsbs.uth.edu/academics/sms-mp-degree-requirements . Please note that there is a special version for S.M.S. students in medical physics.

THE DOCTOR OF PHILOSOPHY IN MEDICAL PHYSICS

COURSEWORK FOR THE PH.D. UNDER THE 2021 CURRICULUM

The minimum number of semester credit hours that are required for the Ph.D. degree is 82. It is rarely the case that a student would not have enough credits to graduate, since most Ph.D. students take the 48 hours of required courses and research tutorials that are listed below, and then spend at least two more years in research to complete their dissertations. Even a student who enters with a master's degree in medical physics and waives many of these courses is almost certain to have enough credit hours just from research and dissertation. However, students who are on extremely ambitious timelines should keep an eye on this matter. If a student anticipates a problem, he or she should discuss this sooner rather than later with the Program Director and with the Office of Academic Affairs at the Graduate School.

Required Courses		Hours
GS02-1052	Imaging Science	2
GS02-1072	Statistics for Medical Physicists	2
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
GS02-1103	Introduction to Medical Physics II: Medical Imaging Physics	3
GS02-1113	Introduction to Medical Physics III: Therapy Physics	3
GS02-1193	Introduction to Medical Physics IV: Nuclear Medicine Physics	3
GS02-1213	Therapy Medical Physics II	3
GS02-1223	Diagnostic Medical Physics II	3
GS02-1202	Electronics for Medical Physicists	2
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
GS02-1133	Introduction to Radiation Protection	3
GS02-1063	Fundamental Anatomy, Physiology and Biology for Medical Physics I	3
GS02-1073	Fundamental Anatomy, Physiology and Biology for Medical Physics II	3
GS02-1731	Medical Physics Seminar	1 × 3
GS21-1051	The Ethical Dimensions of the Biomedical Sciences	1
GS21-1152	Scientific Writing	2

Possible Elective Courses		Hours
GS01-1033	Introduction to Biostatistics and Bioinformatics	3
GS02-1022	Special Radiation Treatment Procedures	2
GS00-1610	Special Project Course: Radiation Transport Methods	2
GS00-1610	Special Project Course: Volumetric Image Reconstruction	2
GS00-1610	Special Project Course: Digital Signal Processing for Medical Physicists	2
GS00-1610	Special Project Course: Digital Image Processing for Medical Physicists	2
GS00-1610	Special Project Course: Grant Writing	1
GS02-1032	Principles of Magnetic Resonance Imaging	2
GS02-1012	Physics of Positron Emission Tomography	2
GS02-1011	Radiation-Induced Late Effects and Survivorship Journal Club	1
GS02-1083	Biological and Biophysical Principles of Molecular Imaging	3
GS02-1021	Supervised Clinical Experience in Radiation Therapy Physics	1
GS02-1031	Supervised Clinical Experience in Imaging Physics	1
	Other electives within the GSBS or at Rice University or the University of Houston	

Research Tutorials		Hours
GS00-1514	Tutorial Research Experience	2 × 3

TYPICAL PH.D. ACADEMIC PLAN UNDER THE 2021 CURRICULUM (M.S. BYPASS OPTION)

Year 1, Fall Semester		Hours
GS00-1514	Tutorial Research Experience 1	2
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
GS02-1202	Electronics for Medical Physicists	2
GS02-1052	Imaging Science	2
GS02-1731	Medical Physics Seminar	1
GS21-1051	The Ethical Dimensions of the Biomedical Sciences	1
	Total	11

Year 1, Spring Semester		Hours
GS00-1514	Tutorial Research Experience 2	2
GS02-1103	Introduction to Medical Physics II: Medical Imaging	3
GS02-1113	Introduction to Medical Physics III: Therapy	3
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
GS02-1731	Medical Physics Seminar	1
	Total	12

***** Goal for Forming the Advisory Committee *****

Year 1, Summer Semester		Hours
GS00-1514	Tutorial Research Experience 3	2
GS02-1213	Therapy Medical Physics II	3
GS02-1223	Diagnostic Medical Physics II	3
	Total	8

***** Deadline for Forming the Advisory Committee *****

Year 2, Fall Semester		Hours
GS02-1072	Statistics for Medical Physicists	2
GS00-1520	Research in Biomedical Sciences	1-3
GS02-1193	Introduction to Medical Physics IV: Physics of Nuclear Medicine	3
GS02-1063	Fundamental Anatomy, Physiology and Biology for Medical Physics I	3
GS02-1731	Medical Physics Seminar	1
	Total	10-12

Year 2, Spring Semester		Hours
GS02-1073	Fundamental Anatomy, Physiology and Biology for Medical Physics II	3
	Electives	0-3
GS00-1520	Research in Biomedical Sciences	1-4
GS21-1152	Scientific Writing	2
	Total	9

Year 2, Summer Semester		Hours
GS02-1133	Introduction to Radiation Protection	3
GS00-1520	Research in Biomedical Sciences	1-3
	Elective, Special Project or Research	0-2
	Total	6

***** Deadline for Scheduling of the Ph.D. Oral Candidacy Examination *****

Year 3, Fall Semester		Hours
GS00-1520	Research in Biomedical Sciences (until candidacy is approved)	9

***** Deadline for Advancing to Ph.D. Candidacy *****

Year 3, Spring Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy (after candidacy is approved)	9

Year 3, Summer Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	1-6
	Elective	X

Year 4, Fall Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 4, Spring Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 4, Summer Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	6

Year 5, Fall Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 5, Spring Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 5, Summer Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	1-6

***** Goal for Defending the Ph.D. Dissertation and Graduating *****

COURSEWORK FOR THE PH.D. UNDER THE 2017 CURRICULUM

The minimum number of semester credit hours that are required for the Ph.D. degree is 82. It is rarely the case that a student would not have enough credits to graduate, since most Ph.D. students take the 47 hours of required courses and research tutorials that are listed below, and then take at least two more years to complete their dissertations. Even a student who enters with a master's degree in medical physics and waives many of these courses is almost certain to have enough credit hours just from research and dissertation. However, students who are on extremely ambitious timelines should keep an eye on this matter. If a student anticipates a problem, he or she should discuss this sooner rather than later with the Program Director and with the Office of Academic Affairs at the Graduate School.

Required Courses		**Hours**
GS02-1052	Imaging Science	2
GS02-1072	Statistics for Medical Physicists	2
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
GS02-1104	Introduction to Medical Physics II: Medical Imaging	4
GS02-1114	Introduction to Medical Physics III: Therapy	4
GS02-1194	Introduction to Medical Physics IV: Nuclear Medicine	4
GS02-1202	Electronics for Medical Physicists	2
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
GS02-1062	Introduction to Clinical Medical Physics	2
GS02-1133	Introduction to Radiation Protection	3
GS02-1063	Fundamental Anatomy, Physiology and Biology for Medical Physics I	3
GS02-1073	Fundamental Anatomy, Physiology and Biology for Medical Physics II	3
GS02-1731	Medical Physics Seminar	1 × 3
GS21-1051	The Ethical Dimensions of the Biomedical Sciences	1
GS21-1152	Scientific Writing	2

Possible Elective Courses		**Hours**
GS01-1033	Introduction to Biostatistics and Bioinformatics	3
GS02-1022	Special Radiation Treatment Procedures	2
GS00-1610	Special Project Course: Radiation Transport Methods	2
GS00-1610	Special Project Course: Volumetric Image Reconstruction	2
GS00-1610	Special Project Course: Digital Signal Processing for Medical Physicists	2
GS00-1610	Special Project Course: Digital Image Processing for Medical Physicists	2
GS00-1610	Special Project Course: Grant Writing	1
GS02-1032	Principles of Magnetic Resonance Imaging	2
GS02-1012	Physics of Positron Emission Tomography	2
GS02-1011	Radiation-Induced Late Effects and Survivorship Journal Club	1
GS02-1083	Biological and Biophysical Principles of Molecular Imaging	3
	Other electives within the GSBS or at Rice University or the University of Houston	

Research Tutorials		**Hours**
GS00-1514	Tutorial Research Experience	2 × 3

TYPICAL ACADEMIC PLAN UNDER THE 2017 CURRICULUM (M.S. BYPASS OPTION)

Year 1, Fall Semester		Hours
GS00-1514	Tutorial Research Experience 1	2
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
GS02-1202	Electronics for Medical Physicists	2
GS02-1062	Introduction to Clinical Medical Physics	2
GS02-1052	Imaging Science	2
GS02-1731	Medical Physics Seminar	1
GS21-1051	The Ethical Dimensions of the Biomedical Sciences	1

Year 1, Spring Semester		Hours
GS00-1514	Tutorial Research Experience 2	2
GS02-1104	Introduction to Medical Physics II: Medical Imaging	4
GS02-1114	Introduction to Medical Physics III: Therapy	4
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
GS02-1731	Medical Physics Seminar	1

***** Goal for Forming the Advisory Committee *****

Year 1, Summer Semester		Hours
GS00-1514	Tutorial Research Experience 3	2
	Elective, Special Project or Research	0-3
GS02-1133	Introduction to Radiation Protection	3
GS00-1520	Research in the Biomedical Sciences	0-4

***** Deadline for Forming the Advisory Committee ***ƒ**

Year 2, Fall Semester		Hours
GS02-1072	Statistics for Medical Physicists	2
GS00-1520	Research in Biomedical Sciences	0-3
GS02-1194	Introduction to Medical Physics IV: Physics of Nuclear Medicine and Magnetic Resonance Imagine	4
GS02-1063	Fundamental Anatomy, Physiology and Biology for Medical Physics I	3
GS02-1731	Medical Physics Seminar	1

Year 2, Spring Semester		Hours
GS02-1073	Fundamental Anatomy, Physiology and Biology for Medical Physics II	3
	Electives	0-3
GS00-1520	Research in Biomedical Sciences	1-6
GS21-1152	Scientific Writing	2

Year 2, Summer Semester		Hours
GS00-1520	Research in Biomedical Sciences	1-6
	Elective, Special Project or Research	X

***** Deadline for Scheduling of the Ph.D. Oral Candidacy Examination *****

Year 3, Fall Semester		Hours
GS00-1520	Research in Biomedical Sciences (until candidacy is approved)	9

***** Deadline for Advancing to Ph.D. Candidacy *****

Year 3, Spring Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy (after candidacy is approved)	9

Year 3, Summer Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	1-6
	Elective	X

Year 4, Fall Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 4, Spring Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 4, Summer Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	6

Year 5, Fall Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 5, Spring Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 5, Summer Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	1-6

***** Goal for Defending the Ph.D. Dissertation and Graduating *****

COURSEWORK FOR THE PH.D. UNDER THE PRE-2017 CURRICULUM

The minimum number of semester credit hours that are required for the Ph.D. degree is 82. It is rarely the case that a student would not have enough credits to graduate, since most Ph.D. students take the 52 hours of required courses, research tutorials and clinical rotations that are listed below, and then take at least two more years to complete their dissertations. Even a student who enters with a master's degree in medical physics and waives many of these courses is almost certain to have enough credit hours just from research and dissertation. However, students who are on extremely ambitious timelines should keep an eye on this matter.

Required Courses		**Hours**
GS02-1183	Applied Mathematics for Medical Physicists	3
GS02-1014	Fundamental Biological Principles of Molecular Imaging and Therapeutics	4
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
GS02-1103	Introduction to Medical Physics II: Medical Imaging	3
GS02-1113	Introduction to Medical Physics III: Therapy	3
GS02-1193	Introduction to Medical Physics IV: Nuclear Medicine	3
GS02-1203	Electronics for Medical Physicists	3
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
GS02-1042	Radiation Biology	2
GS02-1133	Introduction to Radiation Protection	3
GS02-1142	Anatomy and Oncology for Medical Physicists	2
GS02-1731	Medical Physics Seminar	1 × 3
GS21-1051	The Ethical Dimensions of the Biomedical Sciences	1
GS21-1152	Scientific Writing	2

Possible Elective Courses		**Hours**
GS01-1033	Introduction to Biostatistics and Bioinformatics	3
GS02-1022	Special Radiation Treatment Procedures	2
GS00-1610	Special Project Course: Radiation Transport Methods	2
GS00-1610	Special Project Course: Volumetric Image Reconstruction	2
GS00-1610	Special Project Course: Digital Signal Processing for Medical Physicists	2
GS00-1610	Special Project Course: Digital Image Processing for Medical Physicists	2
GS00-1610	Special Project Course: Grant Writing	1
GS02-1032	Principles of Magnetic Resonance Imaging	2
GS02-1012	Physics of Positron Emission Tomography	2
GS02-1011	Radiation-Induced Late Effects and Survivorship Journal Club	1
	Other electives within the GSBS or at Rice University or the University of Houston	

Research Tutorials		**Hours**
GS00-1514	Tutorial Research Experience	2 × 3

Clinical Rotations		**Hours**
GS02-1154	Introductory Radiation Therapy Physics Rotation	4
GS02-1174	Introductory Diagnostic Imaging Rotation	4

TYPICAL ACADEMIC PLAN UNDER THE PRE-2017 CURRICULUM (M.S. BYPASS OPTION)

Year 1, Fall Semester		Hours
GS00-1514	Tutorial Research Experience 1	2
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
GS02-1203	Electronics for Medical Physicists	3
GS02-1042	Radiation Biology	2
	OR	
GS02-1142	Anatomy and Oncology for Medical Physicists	2
GS02-1731	Medical Physics Seminar	1
GS21-1051	The Ethical Dimensions of the Biomedical Sciences	1

Year 1, Spring Semester		Hours
GS00-1514	Tutorial Research Experience 2	2
GS02-1103	Introduction to Medical Physics II: Medical Imaging	3
	OR	
GS02-1193	Introduction to Medical Physics IV: Nuclear Medicine	3
GS02-1113	Introduction to Medical Physics III: Therapy	3
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
GS02-1731	Medical Physics Seminar	1

***** Goal for Forming the Advisory Committee *****

Year 1, Summer Semester		Hours
GS00-1514	Tutorial Research Experience 3	2
	Elective, Special Project or Research	2
GS02-1133	Introduction to Radiation Protection	3

***** Deadline for Forming the Advisory Committee *****

Year 2, Fall Semester		Hours
GS02-1183	Applied Mathematics for Medical Physicists	3
GS00-1520	Research in Biomedical Sciences	1-3
GS02-1042	Radiation Biology	2
	OR	
GS02-1142	Anatomy and Oncology for Medical Physicists	2
GS02-1731	Medical Physics Seminar	1

Year 2, Spring Semester		Hours
GS02-1014	Fundamental Biological Principles of Molecular Imaging and Therapeutics	4
GS02-1103	Introduction to Medical Physics II: Medical Imaging	3
	OR	
GS02-1193	Introduction to Medical Physics IV: Nuclear Medicine	3
GS00-1520	Research in Biomedical Sciences	1-4
GS21-1152	Scientific Writing	2

Year 2, Summer Semester		Hours
GS00-1520	Research in Biomedical Sciences	1-6
	Elective, Special Project or Research	X

***** Deadline for Scheduling of the Ph.D. Oral Candidacy Examination *****

Year 3, Fall Semester		Hours
GS00-1520	Research in Biomedical Sciences (until candidacy is approved)	9

***** Deadline for Advancing to Ph.D. Candidacy *****

Year 3, Spring Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy (after candidacy is approved)	9

Year 3, Summer Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	1-6
	Elective	X

Year 4, Fall Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 4, Spring Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	5
	Clinical Rotation I (Spring or Summer)	4

Year 4, Summer Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	2-6
	Clinical Rotation II (Summer or Fall)	4

Year 5, Fall Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 5, Spring Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	9

Year 5, Summer Semester		Hours
GS00-1920	Dissertation for Doctor of Philosophy	1-6

***** Goal for Defending the Ph.D. Dissertation and Graduating *****

STEPS TOWARD THE PH.D. DEGREE

The full progression to the Ph.D. degree involves:

- The selection of an advisor
- The formation, in co-operation with the advisor, of the Advisory Committee
    - *The advancement to candidacy for the M.S. degree*
    - *The conduct of research for and the writing and defense of the M.S. thesis*
- The formation of the Ph.D. Candidacy Examination Committee
- The preparation of an NIH-style research plan for the candidacy examination and examination by the Examination Committee
- The conduct of Ph.D. research and the writing and defense of the Ph.D. dissertation
- The submission of a manuscript to an acceptable peer-reviewed journal.

The two M.S. steps are indented and italicized in blue because almost all medical physics Ph.D. students skip those two steps by bypassing the M.S. degree. They are able to do this because either they matriculated into the program with a thesis-based master's degree in a physical science or engineering discipline or they used the program's M.S.-bypass option. In either case, it is the Advisory Committee that approves the student's request to bypass the M.S. degree and to proceed directly to the Ph.D. Candidacy Examination. The Candidacy Examination Committee will then assess the appropriateness of bypassing the master's degree as part of the candidacy examination and approve it or not. The academic plan above assumes the M.S. bypass. Students wishing to pursue the M.S. degree *en route* to the Ph.D. should seek guidance from the Program Office.

In order for a student in the Medical Physics Program who does not have a thesis-based master's degree to bypass the M.S., prior to taking the candidacy examination, he or she must have submitted a first-authored manuscript to an acceptable journal based upon work performed here in the Medical Physics Program. This manuscript is in addition to the manuscript that is later expected by the Graduate School of all Ph.D. students by the time of graduation. Students taking the M.S. by-pass option thus are effectively required to have written at least two such papers prior to graduation.

The formal decision to grant the M.S. bypass is made at the time of the student's Ph.D. Candidacy Examination. Detailed guidance for the Candidacy Examination is given below. Sometimes when a student has not quite submitted the manuscript, the committee will give its conditional approval for advancement to candidacy and the by-passing of the M.S. The paperwork is then held in the Program Office until the manuscript is submitted, after which the paperwork is submitted to the GSBS. At the GSBS, this appears as if the student is delinquent in completing his or her candidacy exam. The Academic Standards Committee has decided that when Medical Physics students do not complete our M.S. bypass requirement by the end of their third year, they will be placed on academic probation until the program's requirement (i.e., the submission of the manuscript) occurs.

The Graduate School requires that the "graduation manuscript" have been accepted by a journal before the Ph.D. student can graduate. This policy is intended to encourage Ph.D. students (and their advisors) to have their dissertation work ready for publication well before their defense. This avoids the situation in which a student successfully defends the Ph.D. dissertation but has not written up the work for publication before leaving. Even when such students leave with the best of intentions, the old adage, "out of sight, out of mind," leads to long and counterproductive delays in publication that can harm the student's future career prospects. The best time to write the manuscript is when the material is fresh in the student's mind and when the resources to perform last minute experiments or re-analyses of the data are still available to the student. This requirement encourages students and advisors to consider plans for publications at an early stage in dissertation projects. Given the six months or more that it can take to get even a good manuscript all the way through the review process to acceptance, students should plan ahead and not dawdle.

The Advisory Committee will ultimately judge whether or not the student's research accomplishments are sufficient for the Ph.D. degree. Advisors and committees commonly expect more than one publication before the dissertation defense. Students are strongly encouraged to discuss past publications and plans for future publications with their Advisory Committees at each meeting. The final determination of a student's readiness to defend the Ph.D. dissertation is made by the Advisory Committee. Guidance from the GSBS Website is available here: https://gsbs.uth.edu/academics/phd-degree-requirements.

THE ON-TOPIC PH.D. CANDIDACY EXAMINATION

The Medical Physics program, along with many of the other programs in the Graduate School, administers a so-called "on-topic" examination.

The on-topic examination assesses both the breadth and the depth of the student's knowledge of medical physics and of his or her readiness to embark upon dissertation research. The examination has three parts: a proposal presentation, an examination on the proposal, and an examination on general topics in medical physics.

The depth of the student's knowledge and understanding is gauged through an oral examination that follows the student's presentation of a research proposal. It focuses upon that proposal, including such points as the rationale for the research, its innovation and significance, its background, technical approaches, experimental strategies, interpretation of results and assessment of pitfalls, feasibility, and significance. The originality of the proposal will also be considered.

The examination on breadth is a second oral examination in which the student is asked a broad range of questions regarding medical physics and is given the opportunity to demonstrate that he or she has sufficient knowledge to find a solution to or to develop a rational approach to answering the examiners' questions. The scope of the breadth component would be that of the student's education in medical physics up to that point, which should be at least a minor in physics at the undergraduate level, along with all of the required courses in the Medical Physics Program. Students should anticipate that each of these three parts will take an hour, so that the total duration of the candidacy examination would be three hours.

PREPARATION FOR THE ON-TOPIC EXAMINATION

Students must have taken and passed the Scientific Writing course, GS21-1152, before applying for PhD candidacy.

Students will write a Specific Aims page that includes a clear and scientifically significant hypothesis regarding the work that they are doing for their Ph.D. projects. That hypothesis is to be tested by two to four Specific Aims. This Specific Aims page will be reviewed and approved by the student's Advisory Committee before it is submitted to the Academic Standards Committee of the GSBS as part of the Petition for the Ph.D. Candidacy Examination. The form for that petition can be found on the GSBS Forms page here: https://gsbs.uth.edu/academics/forms. The student's advisor and Advisory Committee may function as teachers to help guide the process of developing the hypothesis and specific aims, but they must ensure that the intellectual content is predominantly the work of the student. The petition for the candidacy examination must be submitted to the Graduate School by the end of the student's second year (which is usually the end of the second summer that the student is in the program). The student is expected to have taken the examination by the end of the first term of his or her third year in the program (which is usually the third fall that the student is in the program).

The student, the advisor and the Advisory Committee will decide upon the composition of the Examination Committee in accordance with the requirements below and those of the GSBS. The student must provide each member of the Examining Committee with the Specific Aims page at the time that the committee is formed.

THE ON-TOPIC EXAMINATION COMMITTEE

The Medical Physics Program has a committee, the Medical Physics Candidacy Examination Committee (see page 65) consisting of four faculty members of whom two represent Radiation Physics and two represent Imaging Physics. One member of this committee from each of the two specialties will serve on each student's candidacy examination committee. Neither of these members may satisfy the requirement that one member be from outside of the student's major discipline. The student's Advisory Committee will invite the two members of this committee, but might not get its first choice, depending on their other commitments. The remaining members of the examination committee will be selected by the student's Advisory Committee. The committee must be chaired by a member of the Medical Physics program faculty. The student's advisor may not serve on the on-topic examination committee. For Medical Physics students, the so-called outside member may not be a medical physicist, regardless of department, but may be a practicing physician from the same Division at MD Anderson as the student and his or her advisor. Members of the faculty of the Medical Physics Program who are not medical physicists may also serve as the outside member.

THE ON-TOPIC RESEARCH PROPOSAL

The student will independently prepare a six-page proposal in the style of an NIH R21 proposal that will include the following sections

- Abstract (350 words or fewer)
- Specific Aims (one page; as described above)
- Research Strategy (six pages)
    - Significance
    - Innovation
    - Approach
- References Cited

Preliminary data are not required for this proposal, but they may be included if they are available. Students may also include model figures that illustrate prior or expected results and may include properly referenced data from other published work. This proposal must be given to the members of the Examining Committee at least four weeks prior to the examination (not just the two weeks that are stated in the general GSBS instructions).

Note that the GSBS Web site refers to an F31 fellowship proposal. The Medical Physics Program prefers that our students follow the R21 exploratory or developmental research grant style because it is more general, and it puts a greater emphasis on significance and innovation, which are essential aspects of a wider range of proposals than just fellowship proposals.

GRADUATE FELLOWSHIPS

One of the benefits of writing an on-topic proposal is that the student will be well along in the process to apply for a pre-doctoral fellowship such as the F-31 Ruth L. Kirchstein Predoctoral Individual National Research Service Award: https://researchtraining.nih.gov/programs/fellowships/F31. First- and second-year Ph.D. students should investigate the range of opportunities that are available and apply for appropriate pre-doctoral fellowships. The GSBS maintains a listing of them here: https://gsbs.uth.edu/current-students/awards-and-funding. The program encourages all eligible students to apply for these awards. It will look good in the future to have received such an award. Having independent funding affords students more flexibility and independence in their research than if their work is tied tightly to the specific aims of their advisor's grants. The GSBS can help with some of the administrative aspects of the proposal. Several members of the Medical Physics faculty have experience as reviewers or mentors of graduate fellowship grants and can help as well.

COMMITTEES

THE M.S. ADVISORY COMMITTEE

The Advisory Committee will advise the S.M.S. student from the beginning of his or her thesis project. The first Advisory Committee meeting should take place as early as the summer semester of the first year. After advancing to candidacy, which is a matter of gaining the approval of the advisory committee, this committee oversees the student's progress for the remainder of his or her degree program.

THE TWO PH.D. COMMITTEES

During the Ph.D. student's graduate career, he or she will assemble two different committees, the Advisory Committee and the Candidacy Examination Committee. Each committee is formed for a specific purpose and need not have the same composition of members.

ADVISORY COMMITTEE

The Advisory Committee will advise the student from the start of the thesis project through the completion of the required coursework and the student's readiness to take the Ph.D. Candidacy Examination. The first advisory meeting should take place in the summer of the first year or early fall of the second year. After the student has advanced to candidacy, this committee then will oversee his or her progress for the remainder of his or her graduate education.

CHOOSING ADVISORY COMMITTEE MEMBERS

Normally, a minimum of three medical physics faculty members (including the student's advisor) must be on the Advisory Committee. The exception would be for students whose advisor and research topic are not in the mainstream of medical physics. In such an exceptional case, at least one member of the advisory committee should be an experienced member of the faculty of the Medical Physics Program in order to ensure that all of the program's requirements are met. The composition of the advisory committee will be an important contributor to the student's overall success since the committee oversees all aspects of his or her education. Thus, it is important to choose faculty members who can best help the student to achieve his or her academic and experimental goals. The advisor's help should be sought in this process since he or she is likely to know more of the faculty members than a student would and is also likely to have some specific ideas about which faculty members can strengthen the committee. The GSBS staff can also be helpful in this process. Other students will have good advice as well. It would be prudent to get the advisor's okay before approaching a prospective committee member in order to avoid the awkwardness of having to withdraw a request to serve on the committee if the advisor does not approve. The GSBS has guidance and rules that are included in the Advisory Committee Proposal form: https://gsbs.uth.edu/files/forms/Formation-of-Advisory-Committee-070221.pdf.

The GSBS has very specific requirements regarding the composition of students' committees and all of the members must be approved by the GSBS Academic Standards Committee. Note that at least one member of each of the committees must have substantial prior GSBS experience on such committees and one of the members must be outside of the student's discipline.

Try to choose a well-balanced committee that includes experts in the planned research area and experts in the techniques and approaches that are likely to be used, as well as outside members who will lend a different perspective to the ideas and approaches. The so-called outside members must be outside of the student's area of research. We strongly suggest that the student discuss the selection of outside members with his or her advisor and with the Program Director, who must approve all committee proposals prior to submission of the requirement documents to the GSBS Academic Standards Committee (ASC). Medical physicists are not considered to be outside members, regardless of their departments. Practicing physicians may be outside members, regardless of their departments. Also, members of the Medical Physics Program faculty who are not medical physicists may serve as outside members. For medical physics students, it is common, but not required, for the outside member to be a member of the Quantitative Sciences Program (i.e., a biostatistician), but that is not universally the case.

In addition to considering the expertise and research interests of prospective committee members, it is also important to consider their availability. It is can be hard to schedule committee meetings when all of the members have extremely busy schedules. Also, it is highly desirable to choose some members who will serve on the Advisory Committee both before and after the Candidacy Examination. This lends some consistency to the student's graduate studies. These "long-term" committee members will become extremely familiar with the student's work and training. This is a factor that becomes critically important when soliciting letters of recommendation for residency or post-doctoral research position applications, fellowship applications, and other career purposes.

It is the student's responsibility to meet with the outside member well in advance of committee meetings to provide background material and to discuss the student's work informally. It would also be helpful to outside members who are not conversant with the area if the student presentations were to begin with a brief general introduction describing the problem that the student is studying. The ASC feels that this experience would also be valuable to students by preparing them for other presentations to general audiences and helping them to organize their thoughts about the significance of their work.

- Individuals who do not belong to the GSBS faculty may serve on a student's committee, but there may be no more than two such individuals on a committee. **Include the NIH-formatted biosketch of each proposed member who is not a member of the GSBS faculty along with the Advisory Committee form**.
- Not all of the GSBS faculty members on a committee may come from the same Department or Program. If four members are from the same Department or Program, the fifth member, must be from outside of the Department or Program and must be a GSBS faculty member. If a committee has non-GSBS faculty, the faculty who are GSBS faculty may not all be from the same Department or Program.
- The advisor of a Ph.D. student must be a Regular Member of the GSBS faculty. Associate Members of the GSBS faculty may advise M.S. students.
- All members of a Ph.D. committee must hold doctoral degrees.
- While all voting members must have academic faculty affiliations, an additional, non-voting member who is not an academic faculty member, but who brings special expertise to the committee is permitted.
- There will be no co-advisors or co-chairs.
- At least one member of the committee must be a GSBS faculty member with extensive GSBS Advisory Committee experience. The experienced member is charged with advising the student regarding GSBS policies and deadlines, and, if necessary, with mentoring inexperienced advisors on GSBS policies.

THE PURPOSE OF THE FIRST ADVISORY COMMITTEE MEETING

The first meeting of the Advisory Committee is a time for the student and the committee to get to know one another. Schedule it during the summer of the first year or, at the latest, early in the fall of the second year. This is very important so that the student's committee can do its job of advising on courses and providing input on the proposed research project.

While it is not necessary to have data to present at the first committee meeting, the committee will expect the student to make a short 20-30 minute presentation on the background of the project, his or her research plans for the next six months, and the project's long term goals. The emphasis should be placed on the plan for the next six months. The student should review the presentation and slides with his or her advisor prior to the committee meeting. Few advisors enjoy being surprised at an advisory committee meeting.

WHAT TO BRING TO THE FIRST ADVISORY COMMITTEE MEETING

Bring enough copies for each member of the committee of the following:

- The student's CV or NIH-style biosketch that includes prior education, degrees earned, honors received, and any publications.
- A list of the research tutorials that have been completed.
- A list of all of the GSBS classes that the student has taken and the grades earned.
- A list of the courses that the student plans to take.
- A written summary of the student's proposed research plan using the Pre-Meeting Student Progress Update form on the GSBS Web site: https://gsbs.uth.edu/academics/forms. This should include an introduction, a simple description of the plan, and the goals for the next six months. It is not necessary to present data at this first meeting.
- The presentation slides. Advice that is generally applicable to all oral presentations is to number the slides. That allows the audience to identify easily to a slide about which they plan to inquire during a questioning session at the end of the presentation.
- The GSBS Report of the Advisory Committee Meeting form from the GSBS Web site: https://gsbs.uth.edu/academics/forms.

The committee might prefer to have some of these in electronic form, rather than paper, especially when some or all of the committee members attend the meeting remotely.

SUBSEQUENT ADVISORY COMMITTEE MEETINGS

At subsequent Advisory Committee meetings, the student must send his or her Pre-Meeting Student Progress Update to the committee members at least five days before the meeting using the form that is provided by the GSBS at https://gsbs.uth.edu/academics/forms. Make sure that the advisor has a copy of the meeting report form. The page of rubrics is complicated enough that giving a copy of the meeting report form to each committee member is useful to them. It is helpful to remind the committee members of how long the student has been enrolled in the GSBS and to inform them of any new publications, courses completed, etc.

For subsequent meetings, the experiments that were attempted or completed in the past six months should be briefly summarized. In all cases, the research summary should end with a list of realistic goals for the next six months, and a comparison to the goals that had been presented at the previous meeting.

Remember, these goals are not contracts; they are simply to help the student to plan the next six months. The goals need not all be met before scheduling the next committee meeting. The committee expects that unforeseen problems or changes in the direction of the student's research will occur. An important function of the committee is to help the student to rise to meet these challenges.

CANDIDACY EXAMINATION COMMITTEE

The Candidacy Examination Committee administers the Ph.D. Candidacy Examination, which should be taken in the summer semester of the second year or the fall semester of the third year.

The student and advisor form the Examining Committee before the student petitions to take the Ph.D. Candidacy Examination. The Medical Physics Program Director must approve the Examining Committee membership prior to the student's submission of the petition to the GSBS Academic Standards Committee. Keep in mind the following requirements when selecting the members:

- The committee must include five faculty members, among them at least two of whom have not served on the student's Advisory Committee.
- Normally, at least three of the five must be members of the Medical Physics Program faculty.
- **The chair of the examining committee must be a member of the Medical Physics Program faculty.**
- Not all of the members may come from the same department or the same GSBS program.
- One member must be from an area of research outside of the student's primary area of interest.
- Individuals who are not members of the GSBS faculty may serve on a student's committee when their particular areas of expertise are not represented on the GSBS faculty, but there may be no more than two such members on the committee.
- If four of the members are from the same Department or Program, the fifth member must be from outside of the Department or Program and must be a GSBS faculty member.
- In the case of an on-topic examination, two members of the Examining Committee must come from the program faculty committee that is charged with helping with candidacy examinations as described earlier.
- The student's Ph.D. advisor is not allowed to be a member of the Examining Committee or even to be present in the room during the examination.

POST-CANDIDACY ADVISORY COMMITTEE

The Advisory Committee typically continues on after the Candidacy Examination as it had before. However, the student and advisor should use this point in the student's progress through the program to assess the direction that the student's research is taking and to fine-tune the membership of the advisory committee if changing its membership would make it more effective.

SCHEDULING ADVISORY COMMITTEE MEETINGS

The purpose of the committee meeting is to get feedback on the student's experimental approaches, interpretations, and goals. Often students delay scheduling a meeting because they feel that they do not have enough new data. Such delays are counterproductive to graduation in a timely manner. Often the time when the committee can be most helpful is when things are going slowly or are not working according to plan. Regular meetings with the committee will keep its members abreast of the student's goals and will give them an opportunity to suggest new approaches, experiments, etc. that could move the work forward. Delaying committee meetings will only slow down the student's progress.

SCHEDULING DEFENSES

Of course, the defense should be scheduled when all of the committee members can attend. Since it includes a public seminar, further considerations are

- Work with the Program Office to schedule your defense.
- An in-person defense should be held on the main campus of MD Anderson (FCT, FC, CPB, the Main Building or the GSBS) rather than on the South Campus or other locations.
- The date and time should not conflict with any Medical Physics Program classes.
- As much as possible, conflicts with meetings and events in the two physics departments should be avoided.
- The plan for the defense should be reviewed by the Program Office before it is finalized.

HOW TO CONTACT THE COMMITTEE MEMBERS

The best way to contact the committee members and set up a meeting is through the support personnel of the student's mentor or by sending Email directly to the committee members. Start working on scheduling a meeting two months in advance. Keep in mind that meetings that are to be held during holiday periods, around the times of national conferences and during the summer vacation months are more difficult to schedule.

SCHEDULING DIFFICULTIES AND CANCELLATIONS OR "NO SHOWS"

If it turns out to be very difficult to find a time when all of the committee members can be present, it is possible to hold the meeting with one member absent, provided that the advisor approves of this and the committee member who will be absent agrees to miss the meeting. After the meeting, be sure to check back with the absent member to discuss what happened.

The exceptions to this are for the Candidacy Examination and the thesis and dissertation defenses, at which all committee members are expected to be present. Note: the GSBS has guidelines regarding committee member substitutions at these meetings when that becomes necessary. Remember, the earlier that the scheduling process is begun, the more likely it will be to be able to find a time when everyone is available. It is unrealistic to wait until a few days before the deadline to hold the next meeting and expect to find a time when five or more busy people can all attend.

RESERVING A MEETING ROOM

Contact the advisor's support staff or a departmental administrative assistant to reserve a room for the meeting. While most Advisory Committee meetings take one to one and one-half hours, reserve the room for two hours in order to provide ample time for setting up before the meeting and for discussion after the presentation.

The room for the Candidacy Examination should be scheduled for three and one-half to four hours, which allows time for setting up, the research plan presentation, the depth examination, the breadth examination, and a bit of time in case any of the phases of the examination runs over or the committee needs to deliberate afterward.

The room for the Dissertation Defense should be scheduled for a total of three hours: an actual meeting duration of two hours (spanning the public presentation and the private examination) with perhaps half an hour prior to set up and half an hour afterward in case the meeting runs longer than usual. Choose a room that is large enough for the size of the anticipated audience. The scheduling of defenses should be co-ordinated with the Program Office. This is important in order to avoid conflicts with other activities in the institution.

MEETING CONFIRMATION AND REMINDERS

After the room has been reserved, send a calendar invitation to the committee members to confirm the date, time and room number for the committee meeting. Also send a reminder Email to them at least five days before the meeting with the Student Progress Update form, and then a final reminder one day before.

PRESENTATION GUIDELINES

For each committee meeting, the student should prepare a 35–45-minute talk summarizing the background of the project, the research goals and the progress toward those goals. The student should review the presentation with his or her advisor prior to the meeting.

The content of the talk should largely follow the written research summary that was submitted to the committee in the pre-meeting update. Review the specific experiments that have been done since the last meeting and end with the goals for the next six months. Keep the presentation focused on the major goals for the thesis. Most advisors have a lot of experience making good slide presentations and should be asked for advice on making the slides. All data should be clearly labeled. Diagrams illustrating the experiments are often helpful. This will be good practice for preparing the elements of publications and of the thesis or dissertation.

During the presentation, committee members might ask for clarification of the experimental approach or results. After the presentation, the committee is likely to ask additional questions in order to initiate a discussion of the quality of the data, the student's interpretation of them, alternative approaches to the problem and so on. The student should take notes of experiments, alternatives, criticisms, etc. that are offered by the committee during this time, as this discussion is intended to help the student.

A well-prepared student who is familiar with his or her research topic can expect the committee meeting to take one to one and one-half hours.

At the conclusion of each meeting, the student should have a clear understanding of the committee's recommendations for future experiments, data analyses, etc. Do not leave a committee meeting without obtaining such a clear view. Do not hesitate to ask for clarification of the committee's recommendation(s) and make sure, with the advisor's assistance, that there is a consensus among the committee members regarding such recommendations.

COMMITTEE MEETING REPORT

Using the form for Report of Advisory Committee Meeting that is available on the GSBS Web site at https://gsbs.uth.edu/academics/forms, the student and the advisor will summarize the results of the meeting. The student should bring a paper copy of this form to the meeting so that the advisor can record the scores in the chart section. The student should complete his or her section immediately after the meeting and forward it to the advisor. The advisor will then fill out the chart on the official report, add the information that is requested on the third page and submit the completed report to the Office of Academic Affairs, GSBS, 3.8344 BSRB with a copy to the Program Office for the student's file. A copy of the report should also be sent by the advisor to each committee member and to the student.

This report is the only official record of the committee meeting, so it is very important that the GSBS receive the report in a timely manner. If the student has not received a copy of the report within a week, a gentle inquiry regarding its status should be made to the advisor.

THE GRADUATE CERTIFICATE IN MEDICAL PHYSICS

The Graduate Certificate in Medical Physics has an abbreviated, CAMPEP-accredited curriculum the successful completion of which qualifies students who already have a Ph.D. in physics or a related discipline to apply to CAMPEP-accredited residency programs and to take the certifying examinations of the American Board of Radiology. The certificate curriculum comprises 30 semester credit hours.

NB: Certificate program students must earn a grade of A or B in each of these courses. If a certificate student were to receive a grade of C or lower, he or she must retake the course and get an A or B in order for it to fulfill the requirements of the certificate program.

COURSEWORK FOR THE CERTIFICATE UNDER THE 2021 CURRICULUM

Required Courses		Hours
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
GS02-1103	Introduction to Medical Physics II: Medical Imaging Physics	3
GS02-1113	Introduction to Medical Physics III: Therapy Physics	3
GS02-1193	Introduction to Medical Physics IV: Nuclear Medicine Physics	3
GS02-1213	Therapy Medical Physics II	3
GS02-1223	Diagnostic Medical Physics II	3
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
GS02-1133	Introduction to Radiation Protection	3
GS02-1063	Fundamental Anatomy, Physiology and Biology for Medical Physics I	3
GS02-1073	Fundamental Anatomy, Physiology and Biology for Medical Physics II	3

TYPICAL ACADEMIC PLAN FOR THE CERTIFICATE UNDER THE 2021 CURRICULUM

Year 1, Fall Semester		Hours
GS02-1093	Introduction to Medical Physics I: Basic Interactions	3
	Total	3

Year 1, Spring Semester		Hours
GS02-1103	Introduction to Medical Physics II: Medical Imaging	3
GS02-1113	Introduction to Medical Physics III: Therapy	3
GS02-1053	Radiation Detection, Instrumentation and Data Analysis	3
	Total	9

Year 1, Summer Semester		Hours
GS02-1213	Therapy Medical Physics II	3
GS02-1223	Diagnostic Medical Physics II	3
	Total	6

Year 2, Fall Semester		Hours
GS02-1193	Introduction to Medical Physics IV: Nuclear Medicine	3
GS02-1063	Fundamental Anatomy, Physiology and Biology for Medical Physics I	3
	Total	6

Year 2, Spring Semester		Hours
GS02-1073	Fundamental Anatomy, Physiology and Biology for Medical Physics II	3
	Total	3

Year 2, Summer Semester		Hours
GS02-1133	Introduction to Radiation Protection	3
	Total	3
	Program Total	30

Note that GS02-1053, Radiation Detection, Instrumentation and Data Analysis could be taken in the Spring of the second year if need be.

MEDICAL PHYSICS PROGRAM AWARDS

AARON BLANCHARD RESEARCH AWARD

The Aaron Blanchard Research Award was established as a memorial to Aaron Blanchard, who was a graduate student in the Medical Physics Program. He succumbed to cancer before earning his degree. The award was endowed by the Blanchard Family and is sustained by their generosity and by other donations to the GSBS. It recognizes a medical physics graduate, either M.S. or Ph.D., for completion of an outstanding thesis or dissertation that is judged by a committee of the program faculty to make a significant contribution to cancer therapy or diagnosis. The recipients of this award are noted in the roster of alumni that appears later in this handbook and on plaques that are displayed in the Program's classroom. The award was first given in 1997.

MOYERS AWARD FOR RESEARCH IN HEAVY ION THERAPY

Our Program alumnus Michael Moyers, PhD, has endowed an award at the GSBS to support the attendance at the Annual Meeting of the American Association of Physicists in Medicine of a student whose work in the area of heavy ion therapy has been selected for presentation in the Young Investigators competition. Students who might qualify are encouraged to apply.

GRADUATE SCHOOL AWARDS

The GSBS has a number of awards and fellowships for students. They are described here: https://gsbs.uth.edu/current-students/awards-and-funding. Program students are encouraged to apply for any for which they are qualified. Our students are usually very successful in receiving these awards.

The Graduate School has given advice to students regarding how to apply effectively. What follows is from a presentation by Dean Mattox in Fall, 2018 that was transcribed by Constance Owens.

1. These are the three main, equally weighted criteria of merit that are used to evaluate each application.
   a. The student's accomplishments in the GSBS
      i. The CV should convey this.
         - Include papers, presentations, external awards, posters
         - Have separate sections for papers and presentations (these are not the same thing!)
   b. Research project
      i. The specific aims page should convey this.
      ii. Particular attention is given to the specific aims, logic, originality, significance, innovation, and clarity of the specific aims page
      iii. The title of a student's project is very important, as this helps Dr. Mattox to know which reviewer to assign the application to. One reviewer is assigned who is in your general area of research. The second reviewer is randomly assigned.
      iv. Note: Remember that reviewers are reviewing several applications, so try to write very clearly. Since most applications are good, reviewers have to look for things to knock down. Sometimes this is grammar or the explanation of a figure, or perhaps the hypothesis or how it will be testing is stated poorly. They try to find things to criticize.
      v. Tip: Imagine that your reviewers are tired, grumpy people. Try to make it easier for your reviewer when you write your proposal.
   c. Potential as a scientist

        i. Letters of support and the latest committee report are used to assess this
2. If a student is applying for an award with specific criteria (e.g., leadership or outreach), you should comment on this in your application (If your adviser or letter writer can comment on this, let them know to include this in their letters of support). Explain why you are well-suited for a specific award in your letter or emphasize this in your CV. Reiterating key accomplishments in your letter is a good idea in case the reviewer missed it or did not make the connection when reading your CV.
3. When asking someone to write your letter of support, make sure that the referee
    a. Is supportive of your application
    b. Knows you well enough to comment in depth
    c. Understands the criteria for the awards

Dr. Mattox gave us advice as to what to ask our referees to include in their letters of support.

4. The advisor or writer should comment on the student's role in developing the application and ideas. The advisor or writer should comment on whether the specific aims page is the student's own work or not (as this is not always clear from the application).
5. Dr. Mattox also informed us that we should emphasize (and the letters of support can also highlight) the progress that we have made in the GSBS since our last application for an award. The GSBS likes to recognize students for progress at the GSBS; publications really improve a student's chances of receiving an award. They do not like to give additional awards to students based on accomplishments for which the student has previously received an award.

How awards are matched.

6. Assignments are made based on donor intent: area of research, stage in training, students' interest in an award, and other award-specific criteria
7. Assignment order: awards are given starting with the highest-ranked students while taking into account the:
    a. Size of the award (the largest awards go to the top students), and the
    b. Narrowness of the donor criteria (some scholarships have criteria such as a student's having received previous training from a specific country or a demonstration that a student has overcome specific disadvantages)
8. You can get more than one award (in the past, students have received as many as three awards in a single application cycle).
9. The GSBS does not like to give the same type of award for the *same* accomplishment
10. You should highlight in your application what you have done *since* the last application cycle (new accomplishments or progress can persuade the GSBS to give you another award!)

Review process.

11. The applications are sorted by title, so it is important that the title accurately reflect your research. One reviewer is assigned who is in your general area of research. The second reviewer is randomly assigned.
12. The reviewers are supposed to give a list of strengths and weaknesses. Applicants can ask Dr. Mattox for the feedback after the application process. Some reviewers write a lot of comments; others don't.
13. The students are ranked, and the committee discusses its rankings.
14. The students are matched to awards based on their ranking and how well they match to the scholarships.

MEDICAL PHYSICS PROGRAM STUDENT POLICIES

STUDENT LEAVE

Students are allocated 80 hours of Vacation Leave with pay for a one-year appointment. This becomes effective on the first day of the appointment. Upon annual re-appointment, they may carry forward a maximum of 80 hours of unused Vacation Leave and accumulate a maximum of 160 hours of Vacation Leave. Students should make time-off requests to their advisors well in advance of taking vacation time.

Students are allocated 50 hours of Sick Leave with pay for a one-year appointment. This becomes effective on the first day of the appointment. Upon annual re-appointment, they may carry forward a maximum of 50 hours of unused Sick Leave and may accumulate a maximum of 100 hours of Sick Leave.

Since Graduate Research Assistant (GRA) appointments are technically part-time, a student would use four hours of time off (be it vacation or sick leave depending upon the situation) for each day of an absence.

ON-SITE ATTENDANCE

Once the pandemic is over, regardless of the source of their funding, as a general rule, all students in the Medical Physics Program will be expected to be on campus at MD Anderson or UTHealth Houston, Monday through Friday, for at least four hours a day between the hours of 8:00 am and 5:00 pm. The faculty may require students to be available on relatively short notice for opportunities such as observing procedures, meeting with visitors and discussing aspects of the student's research. The faculty expects their students to be regularly on-site and working on their studies and research. At times, students will be required to attend seminars, such as those that are given by visiting luminaries in the field of medical physics. During the pandemic, working remotely was a necessity for everyone who could do so, and these rules were temporarily relaxed. As we return to normality, more on-site attendance will be expected.

However, it is recognized that there are times when, perhaps due to equipment availability, students will be required to be present during the nighttime or on weekends and not during the day. Also, there may be times when working off-site (e.g., at home or in the library) may be advantageous (such as when writing a thesis or a paper). The student and advisor should agree on these exceptions to the general rule.

STUDENT GUIDELINES FOR OUTREACH PHYSICS

The faculty members in the Section of Outreach Physics have adopted the following rules and advice for the students who are supported by that group. This is sage advice that would benefit all students.

These guidelines are intended to provide a general reference, as well as some expectations, as your focus evolves from didactic coursework to thesis or dissertation research. This transition can be challenging. These guidelines are to help keep you on track so that you can complete all of your degree requirements following a timeline that you and your advisor have agreed upon. Circumstances for each specific student may differ, so adaptations to the guidelines may be applied.

LOCATION

Think of graduate school as a full-time job; your advisor does. Work should be done in the office unless you have been granted permission to work elsewhere.

Classes, seminars, workshops, etc. may pull you away from the office, but unless these are all day events, you should come to your primary office before or after these commitments. Working from home may be approved by an advisor, but this will only be considered for a short term and for a specific objective, e.g., for a few days in order to knock out a paper.

TIME

Graduate school should be thought of as at least a full-time job (obviously classes, rotations, and other obligations will require time and everyone understands that). One of the perquisites of being a grad student is that this is more flexible than a real job. We all have frustrating days and need to blow off some steam to refocus. Take what you need to avoid burning out or losing your mind, just average out your time over the week. If more time is required, then talk with your advisor to iron out the details.

Balancing research and classes is particularly difficult during the first year when there are a ton of class demands. If your supervisor is paying your stipend and/or tuition during the first year of graduate school, you should put in a minimum of 10 hours of work per week on work for your supervisor (which may include working on your project or preliminary data for a project). Once you have finished your classes, then we expect your full attention and commitment (>40 hours per week). There is a direct correlation between your time commitment and your total time to get your degree.

ATTENDANCE

We like you and want to see you every day!

Remember that institutional holidays are set by MD Anderson, not by the GSBS. Just because the GSBS is closed doesn't mean you have the day off. If you go on a vacation, get your advisor's permission.

If you aren't coming in to work, you need to let your advisor know and should take and log sick and vacation time. Students have two weeks of sick and vacation time each year (in addition to institutional holidays). This is no different than what our office employees do. Remember, our job is to get you out of school in as short of a time as it takes to complete the very best research project. This will not happen if you are not in the office working.

WORK TRAVEL

You should expect to attend the AAPM every year. This means you will need to have an abstract prepared! There may be other conferences that are appropriate for you to attend, too; you should discuss these with your advisor.

When you're at a conference, don't forget that the conference is also considered work time and you should attend sessions and/or meet with colleagues to discuss work. You should also dress in a professional manner, as you represent our office and MD Anderson.

Travel (especially airfare) must be processed through the administrative staff (TaShun or Erika for students in Outreach Physics) as early as possible upon knowing that you will be attending a specific conference. The medical physics program should provide you with travel specifics, but in general: the hotel reimbursement rate means you will almost certainly need to share a room; all receipts must be submitted for reimbursement; take advantage of free meals (if a meal is included at the conference, don't submit a separate meal receipt); no alcohol; max 20% (pre-tax) tip rate. If you have other questions, check with the administrative staff.

Don't forget to get your posters printed well in advance of the meeting.

SCHEDULING

Scheduling of meetings (e.g., committee meetings) should be done by finding a time that works for your advisor and then sending out a Doodle poll to the rest of the committee. Include only 6-8 possible time slots for consideration, not dozens ☺

Each and every one of you is a unique and talented young scientist. We want to make this graduate school experience in the Section of Outreach Physics a fantastic one. If you have any issues or troubles, your advisor is here to help and guide you, but we also depend on you to be responsible and independent adults. Our commitment is to provide you with the guidance, environment and resources for you to complete your degree requirements and research project.

STUDENT ATTIRE AND APPEARANCE

PURPOSE

The purpose of a student dress code is to provide standards that are consistent with those of the staff of the institution. Standards of attire are for the benefit of the students, employees, and patients. They ensure the safety and comfort of all involved.

Students' appearance is observed by others and is a reflection of the individual student, our Medical Physics Program and our profession of medical physics. Students who are part of the GSBS Medical Physics Program are expected to adhere to the guidelines below.

GUIDELINES

General Appearance

- Personal appearance must be appropriate to the work being performed.
- The MD Anderson name badge should be worn in accordance with the Identification (ID) Badge Policy (UTMDACC Institutional Policy # ADM0282).
- Outer garments must be in good taste (style and fit), clean, in good repair and well pressed.
- Clothing with holes, frayed edges or patches is not acceptable.
- Clothing should generally not be more than one badge width above the knee.
- Revealing clothing is not acceptable at any time. Other unacceptable clothing includes: tightly fitting shirts, pants, jeans or skirts, micro minis, low cut necklines, tube/halter/tank/midriff shirts, muscle shirts, tank tops, see-through fabric tops, and tight fitting clothing made of spandex or lycra, strapless tops, tops with spaghetti straps, exceptionally tight or loose garments or bare midriffs).
- Attire should never be offensive, disruptive, or provocative (e.g., racist slogans, obscene words or words with a double meaning and political slogans are not acceptable).
- Disposable shoe covers must not be worn outside the immediate work area unless necessary for infection control reasons.
- No hats or caps unless required for reasons of ethnicity or religion, or to comply with departmental guidelines or health and safety reasons.

- If a respirator is required as part of an employee's job, departmental guidelines or health and safety standards may prohibit beards or moustaches.

Business Casual Clothing

- Clothing on such days should continue to project a professional appearance. Departments may allow denim, jeans, T-shirts and/or sweatshirts (plain or with MD Anderson designs or logos).

Accessories

- Safety precautions in some areas may not permit jewelry.
- Devices or equipment that are not otherwise acceptable but that assist an employee's mobility, hearing, speech, sight, or otherwise mitigate a physical or mental impairment may be approved via the ADA accommodation process (see **Accommodating Disabilities in the Workplace Policy (UTMDACC Institutional Policy # ADM0286)**) and must be consistent with applicable safety standards.

Footwear

- Footwear must provide a safe and secure footing and offer protection against potential hazards.
- For safety and health reasons, employees performing laboratory tests and other related benchwork activities must wear closed-toe shoes.
- Shoes must be in good taste (style), clean and in good repair. Tennis shoes in good condition are allowed.
- Hosiery/Socks for men and women may be required for health and safety reasons.

Grooming

- Good personal hygiene is an essential element of appearance.
- Artificial fingernails may not be allowed based on the **Hand Hygiene Policy (UTMDACC Institutional Policy # CLN0452)**.

Hair

- If beards or moustaches are worn, they must be kept clean, well-trimmed, and neat.
- Employees who work in special cleanliness areas (*e.g.*, dietary) must keep hair restrained by hairnets.

Fragrances

- Fragrances should be used sparingly, if at all, especially by employees having patient contact. Fragrances may be prohibited in areas where individuals are allergic to them.

Identification Badges and Radiation Monitors

- Identification badges must be worn above waist level by all students while on campus.
- Radiation monitors (i.e., dosimeters, which are sometimes called "radiation badges") must be worn by students when they are working in radiation areas. These will be issued by the Radiation Safety Office. They should be exchanged promptly at the end of each wearing cycle.

STUDENT TRAVEL

The rules are complicated and differ for different students, usually based upon the student's home department. Please consult the Program Co-ordinator for advice and the answers to questions. Students may be referred to their home departments for details once they have selected their advisor.

PARENTAL LEAVE FOR GRADUATE RESEARCH ASSISTANTS

The rules for parental leave are extremely complicated. Students should discuss their options with the Program Co-ordinator.

Parental Leave is job-protected leave. According to HR, in an effort to treat employees and trainees fairly, if a student is pregnant and meets the eligibility of having worked fewer than 1,250 hours in a 12-month period immediately preceding the birth or adoption of a child or the placement of a foster child (under three years of age) he or she must contact the Human Resources department (5-myHR) to submit a request for *Parental Leave*.

Highlights*:

- Graduate Research Assistants are considered 0.5 full-time equivalent positions and do not qualify for Family Medical Leave (FML).
- To initiate Parental Leave, the trainee (mother-to-be or father-to-be) contacts the Leave Center at (713) 745-3652 within 30 days of the anticipated date of birth or placement of a child, but after having first notified the trainee's mentor.
- *Parental Leave* begins on the date of the birth of a biological child, or the adoption or foster care placement of a child under three years of age, and it extends for up to 12 weeks.
- The trainee needs to notify the Leave Center of the date that the leave officially begins, which is the date of birth or placement of the child.
- While on *Parental Leave,* the trainee may not work and may not be assigned work by his or her mentor.
- The *Parental Leave Policy* is here: http://inside.mdanderson.org/institutionalpolicy/ACA1163. For clarification, call Human Resources at (713) 745-MyHR.

**This document is a supplement to the Parental Leave Policy. This information was put together to highlight certain aspects of the policy and should not be considered a replacement for other items contained in the official policy. This attachment should be used in conjunction with MD Anderson's Parental Leave Policy and should not stand alone.*

LINEAR ACCELERATOR USE POLICY

Division of Radiation Oncology Linac Use Policy

October 17, 2014

Owners: Service Chiefs, Department Chair, Clinic Director

1) Purpose: Graduate student and postdoctoral fellow "trainees" will have occasion to use linear accelerators (linacs) or the proton machine for measurements. These machines are used for the treatment of patients.
    a) If the trainee does not have a thesis advisor/supervisor that works in the clinic, a co-supervisor from the thesis committee shall be named for the purpose of lending clinical support to the thesis advisor/supervisor and trainee.

2) Safety: It is of paramount importance that trainees observe safe practices when using radiation-producing machines, for their own safety and the safety of patients and clinic staff.
    a) The trainee shall attend a one-hour lecture on linac safety before being cleared to use a linac. The lecture will be given periodically by the Department of Radiation Physics clinical director or their designee. Attendance will be recorded.
    b) It is mandatory that a radiation badge is worn while operating radiation-producing equipment.
3) Hands-on training:
    a) Trainees shall get hands-on linac operation training from their supervisor and/or the linac physicist and/or co-supervisor (with the linac physicist's permission) to comprise of startup, shutdown and linac operation in clinical and service mode. This training will be specific to machine group, e.g., iX, True Beam, Versa. Training may be done as a group, but each student shall demonstrate their ability to independently operate the machine to the linac physicist. The linac physicist shall "clear" the trainee for linac use.
    b) This type of training also applies to all clinical QA measurement equipment that may be used by the trainee. The trainee shall arrange for this training with the physics assistants (PA's) and/or trainee supervisor or the co-supervisor.
4) Duty of the thesis supervisor:
    a) It is the duty of the trainee supervisor to introduce the trainee to the linac physicist, PA's and respective linac engineers.
    b) The trainee's supervisor shall be physically present the first couple of times that the trainee uses a linac until the supervisor is confident that the trainee is able to operate the linac independently.
    c) The trainee's supervising physicist shall be responsible for all the trainee's actions while in the clinic.
5) Arrangement to use linac:
    a) The trainee shall briefly describe to the linac physicist the duration of linac use and type of measurements being made. This is needed to minimize unnecessary unlimited use of the linac. A written description is preferred.
    b) Prior to independently using a linac, the trainee shall ensure that the linac physicist is comfortable with the trainee's understanding of the use of the linac. This might be minimal, but ensures that the physicist has met the student before first use. This also allows for the linac physicist to introduce unique linac features such as CT on Rails, Exactrac, etc. to the trainee.
    c) Each time the trainee needs to use a specific linac, the trainee shall email (at least 24 hour in advance) Radonc Linax cc'ing the linac physicist and backup linac physicist and trainee supervisor requesting to use the linac. The engineers shall not assign the linac to the trainee unless one of the linac physicists confirms that the trainee is cleared to use the linac.
    d) In the case there is a conflict with the linac schedule, the use of the linac for clinical use such as patient treatment, IMRT QA, linac QA has higher priority.
    e) In case the linac physicist is out, the linac representative becomes the backup linac physicist or another physicist from the clinical service.
    f) The trainee shall operate the linac when engineering and/or physics support is available (the trainee checks with engineering). At the conclusion of the use of the linac, the trainee should email the linac physicist, supervising physicist and engineers that they are done with the linac and run the daily QA to ensure that everything is in working order for patient treatments.
6) Measurement equipment:
    a) Any equipment that will be required should be requested from the PA's 24 hours prior.
    b) The trainee must let the PA know that they have the approval of the supervisor and the linac physicist.
    c) All equipment shall be returned to the original location, or the location designated by the physics assistant, in the condition that it was found (cables rolled up, tanks free of water, etc.).
    d) Additionally, the trainee shall contact the PA's before beginning measurements on the linac to make sure there is no QA to be delivered on that linac that evening.
7) Consequences:
    a) The linac physicist or representative has the right to deny linac use to a trainee.

b) If there are any issues with the linac following the use by the trainee, the trainee shall meet together with their supervisor and the linac physicist to determine if the student may use the linac (or any linac in the department) in the future without their supervisor being present.

Please contact Rajat Kudchadker, Ph.D. or Peter Balter, Ph.D. with questions about this policy.

MD ANDERSON AND UTHEALTH RESOURCES

MD ANDERSON RESEARCH WEEKLY

Research Weekly is a week-at-glance listing of scientific events at MD Anderson. It is distributed each Thursday. The email contains a brief description of scientific events for the following week. To subscribe, send Email to researchweekly@mdanderson.org and ask to be added to their mailing list.

MD ANDERSON POST-DOCTORAL HANDBOOK

MD Anderson publishes a handbook for post-doctoral fellows and other trainees. It has lots of useful information about Houston, the Texas Medical Center and MD Anderson: https://www.mdanderson.org/content/dam/mdanderson/documents/education-training/postdoctoral-association/pda_welcome_handbook_prospective_postdocs.pdf

MD ANDERSON EDITING SERVICES

Hours: Monday – Friday 8:00 am to 5:00 pm
Phone: (713) 792-3305
Location: Pickens Academic Tower, 6th floor (FCT6.5086).
Website: https://mdandersonorg.sharepoint.com/sites/research-medical-library/SitePages/Our-Editing-Services.aspx

The Editing Services group in the Research Medical Library provides a wide range of editorial services to the MD Anderson Cancer Center community that are free of charge. Their main role is to assist MD Anderson faculty and staff with their publishing endeavors. They are available to

- Edit journal articles, book chapters, grant proposals, and abstracts.
- Consult with authors on early drafts of their work.
- Answer questions about publishing, book and journal production, diction, grammar, and style.

They have some useful advice on their Web site for writing grant proposals and research papers. See https://mdandersonorg.sharepoint.com/sites/research-medical-library/SitePages/Writing-R01-Grant-Proposals.aspx and https://mdandersonorg.sharepoint.com/sites/research-medical-library/SitePages/Advice-on-Writing-Journal-Articles.aspx.

MD ANDERSON RESEARCH MEDICAL LIBRARY

Hours
Monday – Friday: 7:30 am to 7:00 pm
Saturday: Closed
Sunday: Closed

Telephone Numbers
Information Desk: (713) 792-2282
Document Delivery: (713) 745-4531
Fax: (713) 563-3650

Location: Pickens Academic Tower, 21st Floor. 1400 Pressler Street

Website: http://www3.mdanderson.org/library/

Journal and Online Database Access

The Research Medical Library licenses access to over 15,000 journals online and subscribes to approximately 550 journals in print. For recent years, about 90% of the print journals are also available online. The Online Journals page of the library's website is the one best place to check to see what the library has available both online and in print. The library also provides access to approximately 100 licensed databases through the Databases page of its website.

Remote Access and Library Privileges

The Research Medical Library is a member of the Texas Health Science Libraries Consortium (THSLC), which includes the major University of Texas component libraries in the Medical Center and the library of UTMB in Galveston. Registering for library privileges with one library provides borrowing privileges at all members of the consortium. The libraries share an online catalog of their collections, and users can search the collections of all of the libraries at one time.

Most Research Medical Library services, such as remote access or requesting a copy of an article through document delivery (ILLiad) may be accessed using the M. D. Anderson login credentials. Students who do not have an MD Anderson "MyID" login may register for an account by calling the Research Medical Library at (713) 792-2282 or writing to MRML-HELP@MDANDERSON.ORG.

Library Classes

The library offers free classes throughout the year on many topics of scholarly utility. These are described here: http://www3.mdanderson.org/library/education/index.html.

MD ANDERSON STRATEGIC COMMUNICATIONS

Hours and Phone
Monday – Friday 8:00 am to 5:00 pm
Client Service: (713) 792-3030

Location: Fannin Holcombe Building

Main Website: https://myteams.mdanderson.org/depts/co/sc/SitePages/schome.aspx

About Creative Services

Strategic Communications is a fee-for-service department located on The University of Texas MD Anderson Cancer Center campus. Our many services include video production, medical and general photography, graphic design, medical illustration, poster printing, special awards and full-service framing. As brand ambassadors for MD Anderson, we'll make sure that everything we create follows the brand standards for the institution.

Our services are available to MD Anderson, the University of Texas System and other health, education and research related institutions primarily located in the Texas Medical Center.

Online Templates

- Scientific Poster Templates for PowerPoint and Illustrator and many other helpful hints can be obtained from the MD Anderson Brand Central site at: https://mdabrandcentral.com/site/login
- If you use their poster templates, consider replacing the stock photograph (which is typically of a building at MD Anderson) with an illustration that is germane to your research group or project.
- Also, be sure to include your GSBS affiliation.

MD ANDERSON OMBUDS OFFICE

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Location: Pickens Academic Tower (FCT10.5081), 1400 Pressler Drive

Website: http://www.mdanderson.org/about-us/for-employees/employee-resources/ombuds-office/index.html

About the Ombuds Office *(from the Ombuds former web page)*

> *"The MD Anderson Ombuds Office provides a confidential, impartial, independent and informal process to facilitate fair and equitable resolutions to workplace concerns that arise at the MD Anderson Cancer Center. The Ombuds Office takes into consideration the interests of all individuals and the interests of the institution in a given situation. The Ombuds Office serves all members of the MD Anderson workforce, including trainees and fellows, by responding promptly and fairly to concerns, complaints or disputes arising from or affecting their work environment, and by providing a safe place to discuss these issues without fear of retaliation."*

What are some common problems people present to the Ombuds Office?

> *"Any type of conflict in the workplace that an objective third party could clarify or mediate is appropriate. Employees often come to the Ombuds Office to discuss interpersonal misunderstandings, feelings of abuse of power or disagreements about policy, procedure or career concerns. People often visit the Ombuds Office when they are not sure where to go, or where to seek guidance, or how to address the problem, or what options are available. The Ombuds Office is a good place to discuss a sensitive question or issue. For example: Difficult work relationships; Perceived unfair treatment; Management problems." "What about confidentiality? Confidentiality is respected and protected so that individuals can freely clarify their problems without fear of retribution or loss of standing with friends, peers or supervisor."* Visit their website to learn more about their confidentiality policy and their services.

MD ANDERSON EMPLOYEE ASSISTANCE PROGRAM (EAP)

Contact: (713) 745-6901 or hreap@mdanderson.org

Hours: Monday-Thursday, 7:30 am – 9:00 pm, Friday, 7:30 am – 4:30 pm

After Hours Urgent Calls: (281) 537-7445 or (800) 848-4641. Say that you are an MD Anderson student, employee or dependent and ask to speak to the on-call EAP counselor.

Website: https://mdandersonorg.sharepoint.com/sites/employee-assistance-program

About the EAP Program *(edited from the EAP web page 8/20/15)*

MD Anderson's Employee Assistance Program (EAP) contributes to a healthier and more productive work environment by assisting employees and their families with problems that affect their lives both on and off the job.

Any employee, faculty member, designated trainee, student or retiree is eligible to use EAP services at no cost. Immediate family members of employees and faculty are also eligible to benefit from these same services at no cost.

EAP SERVICES

Consult with the EAP when any of these apply:

- **Work-Related** - Conflicts with coworkers, career worries, adapting to new circumstances, communicating with supervisors, or feeling "burned out" with current job.
- **Personal** - Worried, anxious, fearful, irritable or sad much of the time; dealing with a major life decision; having difficulty managing responsibilities; trouble with concentrating, staying focused; dealing with the loss of a loved one; concerned about the use of alcohol or drugs; needing help with addictive behaviors; challenged with new circumstances; or looking for a mental health care provider.
- **Family and Relationships** - Marital or relationship issues, domestic conflict or abusive relationships, family illness, financial worries, parent-child concerns, or teenage and childhood behavioral problems.
- **Legal Issues** - Divorce, child custody, juvenile, child support, consumer law, property, elder law, immigration law, wills, estate planning, probate, criminal, bankruptcy, personal injury, traffic, litigation, and contracts.

Confidentiality *(from the EAP web page 8/20/15)*

> *"EAP information is kept strictly confidential, consistent with applicable laws and professional standards. In the case of a self-referral or supervisor-suggested referral, information is not released to anyone without the authorized consent of the client. In the case of a formal supervisor referral, the EAP notifies the supervisor to confirm only whether or not the employee has contacted the EAP and whether recommendations have been followed."*

UT STUDENT HEALTH AND COUNSELING SERVICES

Phone: (713) 500-5171 or (713)500-5173 after 5 p.m.

Hours: Monday-Friday, 9 a.m. to 4:30 p.m.

Counseling Website: https://www.uth.edu/studenthealth/

UT Student Health and Counseling Services provides mental health, psychiatry and psychological counseling. Please visit their website to learn more about their services. To schedule an appointment, call (713) 500-5171.

UNIVERSITY OF TEXAS POLICE DEPARTMENT

Non-Emergencies: (713) 792-2890

Emergencies: 911

Website: https://www.utph.org/

The University of Texas at Houston Police Department (UT Police) provides law enforcement and community services to the MD Anderson Cancer Center and UT Health Science Center at Houston institutions.

PARKING, METRO AND UT SHUTTLE SERVICE, AND OTHER TRANSPORTATION

PARKING

Parking options vary depending on distance and cost. For up-to-date information, it is best to check the GSBS, UTHSC, or MD Anderson websites. Note that different lots and garages are owned and managed by different entities and thus have different rules and different deals such as after-hours parking in affiliated facilities.

GSBS: https://gsbs.uth.edu/current-students/student-life.htm#panel2-6937070a-a94d-4a36-a7dd-c7532d5ab46e

UTHSC – Auxiliary Enterprises: http://www.uth.edu/parking/index.htm

MD Anderson: http://inside.mdanderson.org/departments/facilities/getting-around/parking.html

METRO LIGHT RAIL AND BUS INFORMATION

METRO is Houston's bus and light rail service. The regular one-way fare for METRORail or local METRO bus service is $1.25. The student discount of 50% is only valid when you use the METRO "Q" card, which is an electronic card that is loaded with a pre-paid balance. Fares are automatically deducted from your card each time that you ride, just like a debit card. It provides free transfers. Value can be loaded onto a Q card at places such as grocery stores and also using machines in the buses.

The TMC Transit Center, which is a hub for many bus routes and is on the light rail line, is on Fannin Street between Holcombe and Pressler, across Fannin from the Cancer Prevention Building.

The student Q card application is here: https://www.ridemetro.org/MetroPDFs/Fares/DiscountedFares/Student-Q-Card-Form.pdf

MDACC SHUTTLE SERVICE

MDACC provide free shuttle services for students (with ID badge). Hours: 7:00 am to 5:00 pm. There is a smartphone app (see the Track a Shuttle link in the page below) that allows one to see the locations of the shuttles in real time.

https://mdandersonorg.sharepoint.com/sites/Home/SitePages/Shuttles.aspx

UTHSC-H SHUTTLE SERVICE

Free shuttle service for students between UT housing and the Texas Medical Center is provided by UTHSC-H. You must present your student ID to ride the bus. The shuttles generally operate Monday through Friday between 6:00 am and 8:00 pm. The shuttle schedule is posted at: http://www.uth.edu/shuttle/index.htm.

RICE BRC/TMC SHUTTLE SERVICE

The Rice University Transportation Department runs a shuttle bus through the Rice campus and the Texas Medical Center. (BRC stands for the BioScience Research Collaborative, which is located on the southwest corner of Dryden Road and University Boulevard.) There is no charge for our students and faculty members to use it to get to classes and seminars on the Rice Campus. The route and schedule may be found here. Click the expanded route map to see the stops in the Texas Medical Center https://transportation.rice.edu/sites/g/files/bxs3961/files/inline-files/BRC-route-map-9-19-13.pdf.

BCYCLE

Houston BCycle bicycle rental stations may be found in various spots around the Texas Medical Center and the surrounding neighborhoods. More information is here: https://www.houstonbcycle.com/.

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Peter Balter, PhD	Radiation Physics/2023	713-563-2560	FCT6.5060	pbalter@mdanderson.org

STUDENT DIRECTORY

Student, Degree Program, and Year of Matriculation			Faculty Advisor	Office Telephone	Office Room No.	Email
Antony Adair	Cert	2021	Howell	713-745-4979	PTC1.2070	ahadair@mdanderson.org
Yasaman Barekatain	PhD	2017	Kalluri		4SCR5.1325	ybarekatain@mdanderson.org
Hana Baroudi	PhD	2020	Court			hbaroudi@mdanderson.org
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Fre'Etta Brooks	PhD	2019	Kry	713-745-2536	ERD1.324	fmbrooks@mdanderson.org
Joseph DeCunha	PhD	2020	Court	713-745-3677	FCT8.6073	jdecunha@mdanderson.org
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Madison Grayson	PhD	2021	Mohan			megrayson@mdanderson.org
Aashish Chandra Gupta	PhD	2021	Brock			acgupta1@mdanderson.org
Shannon Hartzell	PhD	2019	Kry	713-745-8943	ERD1.324	shartzell@mdanderson.org
Collin Harlan	PhD	2021	Bankson			cjharlan@mdanderson.org
Yulun He	PhD	2017	Brock	713-745-3681		yhe5@mdanderson.org
Soleil Hernandez	PhD	2018	Court	713-745-1873	FCT8.6013	sherhandez6@mdanderson.org
Zongsheng Hu	PhD	2022	Howell			
Kai Huang	PhD	2018	Court		FCT8.6013	khuang5@mdanderson.org
Benjamin Insley	PhD	2020	Salehpour		FCT8.6103	bainsley@mdanderson.org
Zaphanlene Kaffey	PhD	2022	Howell			
Brian Kelly	SMS	2022	Howell			bmkelley@mdanderson.org
Liao Li	Cert	2022	Howell			
Tianzhe Li	PhD	2018	Pagel		3SCR4-4803	tli7@mdanderson.org
Rebecca Lim	PhD	2022	Howell			
Kevin Liu	PhD	2021	Schueler		Z7.5000	kliu1@mdanderson.org
Alan Lopez Hernandez	SMS	2022	Howell			
Barbara Marquez	PhD	2019	Court		FCT8.6013	bmarquez@mdanderson.org
David Martinus	PhD	2020	Sawakuchi		Z7.5000	dmartinus@mdanderson.org
Lucas McCullum	PhD	2022	Howell			
Hunter Mehrens	PhD	2020	Kry	713-745-8989	ERD1.324	hsmehrens@mdanderson.org
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Taylor Meyers	PhD	2022	Howell			
Samuel Mulder	PhD	2020	Fuller		FCT14.5021	smulder@mdanderson.org
Kelly Nealon	PhD	2019	Court	713-563-2549	FCT8.6013	kanealon@mdanderson.org
Constance Owens	PhD	2015	Howell		ERD1.324	caowens@mdanderson.org
Saleh Ramezani	PhD	2015	Farach-Carson	713-745-4026	3SCR4.4803	sramezani@mdanderson.org
Brandon Reber	PhD	2019	Brock			breber@mdanderson.org
Ramon Salazar	Cert	2022	Howell	713-563-2514	FCT8.6009	rmsalazar1@mdanderson.org
Hayden Scott	SMS	2020	Kry		ERD1.319	hfscott@mdanderson.org
Suman Shrestha	PhD	2018	Howell	713-745-3539	ERD1.221C	sshrestha1@mdanderson.org
Erin Snoddy	PhD	2021	Howell			epsnoddy@mdanderson.org
Jian Ming Teo	PhD	2021	A. Liu			jteo@mdanderson.org
Paige Taylor	PhD	2020	Kry	713-745-8984	ERD1.314	pataylor@mdanderson.org
Ivan Vazquez	Cert	2021	Howell		PTC1.2000	ivazquez@mdanderson.org
Natalie West	PhD	2022	Howell			
Cenji Yu	PhD	2018	Court		FCT8.6013	cyu4@mdanderson.org
Yao Zhao	PhD	2019	Yang	713-563-2549	FCT8.6013	yzhao15@mdanderson.org

ALUMNI – SPECIALIZED MASTER OF SCIENCE

S.M.S. Graduate	Year	Thesis	Advisor
Ronald W. Cowart	1976	An Investigation of the Inverse Pinhole Camera	Alfonso Zermeno, PhD
Mina Behmard	1977	Displacement Correction Factors for High Energy X-rays	Peter R. Almond, PhD
Charles A. Wissuchek	1978	Spectrum Measurement in Diagnostic X-ray: A New Technique	Alfonso Zermeno, PhD
Richard H. Stark	1979	Design and Use of Zero Replacement Tissue Equivalent and Air Equivalent Ionization Chambers	William F. Gagnon, PhD
Jeffrey A. Meyer	1979	A Rational Modulation Transfer Function in Medical Imaging	Alfonso Zermeno, PhD
Marcia D. Sage	1979	The Effect of the Characteristic Curve Shape in the Determination of the Line Spread Function and the Modulation Transfer Function of Radiographic Film-Screen Systems	Arthur G. Haus, PhD
Kanayo E. Ubesie	1981	Ion Collection Efficiency Determinations for Cylindrical Ionization Chambers Irradiated with Scanned Electron Beams	William F. Hanson, PhD
Stephen H. Mahood	1982	Evaluation of High Energy X-ray Replacement Factors for Cylindrical Ionization Chambers	Peter R. Almond, PhD
Chirapha Tannanonta	1982	Investigation of Neutrons Inside and Outside of the X-ray Beam Produced by Linear Accelerators	Robert J. Shalek, PhD
Connel Chu	1983	Evaluation of the Thermoluminescent Characteristics of Neutron Insensitive Lithium Borate and Lithium Fluoride on Therapeutic Heavy Charged Particle Beams	Kenneth R. Hogstrom, PhD
Alex M. Hashemi	1986	Determination of Exposure Rate Constant for a New Design I-125 Seed	Michael D. Mills, PhD
Richard N. Umeh	1986	Determination of X-ray Beam Quality Changes of Linear Accelerator from Ionization Measurements in Phantom	William F. Hanson, PhD
Charles M. Able	1987	Evaluation of the MDACC Total Scalp Electron Irradiation Technique	Michael D. Mills, PhD
Min Jing	1987	Calculation of Cobalt-60 Dose Distributions using Fast Fourier Transforms	Arthur L. Boyer, PhD
Pei-Fong Wong	1987	Comparison of Electron Beam Depth-Dose and Off-Axis Profile Measured with Various Detectors in Water and Plastic	William F. Hanson, PhD
R. Cole Robinson	1989	Energy Response of LiF TLD-100 to High Energy Photon Beams	Thomas H. Kirby, PhD
Ramaswamy J. Sadagopan	1989	Application of a Laplace Transform Pair Model to Deconvolve High Energy Photon Spectra from Transmission Measurements	William F. Hanson, PhD

S.M.S. Graduate	Year	Thesis	Advisor
Gregory S. Dominiak	1991	Dose in Spinal Cord Following Electron Irradiation	George Starkschall, PhD
Scott M. Jones	1991	The Application of FFT-Based Correlation to Digital Portal Images	Arthur L. Boyer, PhD
Qamar U. Zaman	1991	Determination of Perturbation Correction Factor for Cylindrical Chambers in an Electron Beam	William F. Hanson, PhD
James M. Bruno	1992	Differentiation Between Calcium Hydroxyapatite and Calcium Oxalate Microcalcifications on a Mammogram Based on Their Imaging Properties: A Phantom Study	Jose A. Bencomo, PhD
Michael J. Gazda	1992	Response of the Lacrimal Gland to Single Doses of Radiation: A Time and Dose Study	Timothy E. Schulltheiss, PhD
Laurie F. Hefner	1992	Single Field Depth Characteristics Measured using Ferrous Sulphate Gels and MRI: A Comparison with Film and Ion Chamber Measurements	John D. Hazle, PhD
Sergio D. Ballester	1993	Two Models for Estimating Maximum Spinal Cord Dose for Long Irradiation Treatments	William F. Hanson, PhD
Maria N. Graves	1993	Evaluation of ICRU Interstitial Implant Doses: Central and Peripheral Dose	William F. Hanson, PhD
George E. Merk	1993	The Application of ROC Analysis in Comparing Detection Ability of Portal image Localization Errors	Arthur L. Boyer, PhD
Edward R. Bawiec	1994	Quality Assurance of Electron Bolus	George Starkschall, PhD
Twyla R. Willoughby	1994	Application of a Neural Network in Evaluating and Optimizing Three-Dimensional Treatment Plans	George Starkschall, PhD
E. Joe Grant	1994	A Triple Energy Window Method for In Vivo Quantization of Iodine-131 from Anger Camera Images	Daniel J. Macey, PhD
Timothy J. Waldron	1995	Calculation of Dynamically-Wedged Isodose Distribution from Segmented Treatment Tables and Open-Field Measurements	Arthur L. Boyer, PhD
Robert Praeder	1995	Prediction of Electron Beam Output Factors using a Pencil Beam Model with Two Gaussian Components	Almon S. Shiu, PhD
Peter A. Balter	1995	The Development of a Mailable Phantom for Remote Monitoring of Stereotactic Radiosurgery	William F. Hanson, PhD
Sarah A. Danielson	1996	MR Image Segmentation of Tumor and Necrosis in Soft-Tissue Sarcomas	Edward F. Jackson, PhD
Dena McCown Richards	1996	Acquisition, Processing and Display of Helical X-ray Computed Tomography Angiogram	John D. Hazle, PhD
Kyle J. Antes	1996	Comparison of Miniature Multileaf Collimation (MMLC) with Circular Collimation for Stereotactic Radiosurgery and Radiotherapy	Almon S. Shiu, PhD

S.M.S. Graduate	Year	Thesis	Advisor
Stephen K. Thompson	1996	Performance Analysis of a Lossy Compression Algorithm for Radiology Based on Cubic Spline Wavelets	John D. Hazle, PhD
Donna M. Reeve	1997	Pharmacokinetic Model Parameter Estimation for Brain Lesions using Dynamic Keyhole Fast Spin-Echo MR Imaging	Edward F. Jackson, PhD
Victor L. Howard	1997	Study of Distortions in Radiotherapy Simulator Fluoroscopic Images	Isaac I. Rosen, PhD
Matthew K. Vossler	1998	A Comparison of the Photon Energy Spectra of Several Radiotherapy Linear Accelerators	William F. Hanson, PhD
Jonathan M. Dugan	1998	Computer Modeling of a Photostimulable Phosphor Digital Imaging Device	Douglas Tucker, PhD
Teresa A. Fischer	1998	Retrospective Analysis of Lung Fibrosis Following Radiation and Chemotherapy for Lung Cancer *Blanchard Award*	Isaac I. Rosen, PhD
Russell B. Tarver	1998	Wavelet Compression of Simulated Computed Tomography Images	John D. Hazle, PhD
Michael R. Bieda	1999	A Monte Carlo Method for Commissioning Electron Beams	John A. Antolak, PhD
Chris Baird	2000	Dosimetry of Large-Breasted Patients Utilizing Compensators	George Starkschall, PhD
Luke McLemore	2000	Dosimetric Characterization of a Palladium-103 Implanted Stent for Intravascular Brachytherapy	John L. Horton, PhD
Michael Lemacks	2000	Two Methods for Improving the Detectability of Microcalcifications in Digital Mammography	Chris C. Shaw, PhD
Dee-Ann Radford	2001	A Standardized Method of Quality Assurance for Intensity Modulated Radiation Therapy of the Prostate	David S. Followill, PhD
Amanda Krintz	2002	A Re-analysis of the Collaborative Ocular Melanoma Study Medium Tumor Trial Eye Plaque Dosimetry	David S. Followill, PhD
Christopher Cherry	2002	A Heterogeneous Thorax Phantom for Remote Verification of Three-Dimensional Conformal Radiotherapy	William F. Hanson, PhD
Laura Butler	2002	Dosimetric Benefit of Respiratory Gating	George Starkschall, PhD
Nicholas C. Koch	2002	Assessment of Respiratory Motion for Radiation Therapy of Lung Cancer Using Magnetic Resonance Imaging	H. Helen Liu, PhD
Jennifer C. O'Daniel	2002	The Delivery of IMRT with a Single Physical Modulator for Multiple Fields: A Feasibility Study for Prostate and Paranasal Sinus Cancers *Blanchard Award*	Lei Dong, PhD

S.M.S. Graduate	Year	Thesis	Advisor
Michael Beach	2003	Implementation of a Polymer Gel Dosimetry Insert for an Anthropomorphic Phantom Used to Evaluate Head and Neck Intensity-Modulated Radiation Therapy	Geoffrey S. Ibbott, PhD
Pai-Chun Melinda Chi	2005	A Three-Dimensional Pencil-Beam Redefinition Algorithm for Electron Arc Therapy	Kenneth R. Hogstrom, PhD
Gary Fisher	2005	The Accuracy of 3-D Inhomogeneity Photon Algorithms in Commercial Treatment Planning Systems using a Heterogeneous Lung Phantom	David S. Followill, PhD
Jackeline Santiago Estaban	2005	Energy Dependence of a New TLD-100 System for Characterizing Low Energy Brachytherapy Sources	Geoffrey S. Ibbott, PhD
Claire Therese Nerbun	2005	Analysis of MD-55-2 Gafchromic® Film as a Dosimetry Audit System for Proton Therapy	David S. Followill, PhD
Hilary Loupee Vass	2005	Comparison of the Microskeleton PDR ^{192}Ir Source to Traditional LDR ^{137}Cs for Treating Gynecological Cancers in a 10 Patient Monte Carlo Study	Geoffrey S. Ibbott, PhD
Kenneth L. Homann	2005	Evaluation of the Dose within the Abutment Region between Tangential and Supraclavicular Fields for Various Breast Irradiation Techniques	Karl Prado, PhD
Scott Davidson	2006	Heterogeneity Dose Calculation Algorithm Accuracy in IMRT using Anthropomorphic Thorax Phantom	David S. Followill, PhD
Earl Gates	2006	The Dosimetric Impact of IMRT on Out-of-Field Structures in the Treatment of the Intact Breast: A Companion to Forward-Planned Techniques	Mohammad Salehpour, PhD
Ryan Hecox	2006	Dose Calculation Accuracy in the Presence of High-Z Material using Megavoltage CT for Treatment Planning	Geoffrey S. Ibbott, PhD
Michael Bligh	2006	Implementation of Quantitative Computed Tomography on Multi-Slice Computed Tomography Scanners	Dianna Cody, PhD
Blake Cannon	2006	Quantitative Diffusion and Fat Imaging of Vertebral Compression Fractures	Jingfei Ma, PhD
Alanna McDermott	2007	Validating Pediatric CT Surface and Organ Doses Predicted by Monte Carlo Simulations using Point Dosimetric Measurements	Dianna Cody, PhD
Paige Nitsch	2007	Assessment of CyberKnife's Heterogeneity Dose Calculation Algorithm and Respiratory Tracking System using an Anthropomorphic Thorax Phantom	Geoffrey S. Ibbott, PhD
Susannah Lazar	2007	Risk of Secondary Fatal Malignancies from Hi-Art Tomotherapy IMRT	David S. Followill, PhD

S.M.S. Graduate	Year	Thesis	Advisor
Renee Dickinson	2007	Technical Improvement of Lymphoscintigraphy	Richard E. Wendt III, PhD
Jimmy Jones	2008	Study of the Radiation Damage to Plastic Scintillating Fibers and Optical Fibers	A. Sam Beddar, PhD
Maria Bellon	2008	Risk of Secondary Fatal Malignancies from Cyberknife Radiosurgery	David S. Followill, PhD
Nathan Pung	2008	Validation of a Conversion Method of Low Dose Rate to Pulsed Dose Rate Intracavitary Brachytherapy Prescription for the Treatment of Cervical Carcinoma	Firas Mourtada, PhD
Yevgeney Vinogradskiy	2008	Verification of 4D Dose Calculations	George Starkschall, PhD
John Zullo	2008	Validation of Intensity Modulated Radiation Therapy Point Dose Calculation Accuracy Performed using a Scatter Integration-Based Algorithm	Karl Prado, PhD
Triston Dougall	2009	Optimization of Exposure Factors for Digital Radiography by Means of CdT X-ray Spectroscopy	Charles Willis, PhD
Georgi Georgiev	2009	Comparison of Secondary Doses in Pediatric Patients from Craniospinal Irradiations using Photon, Proton and Electron Spinal Fields	David S. Followill, PhD
Ryan Grant Lafratta	2009	Implementation of an Anthropomorphic Pelvis Phantom for the Evaluation of Proton Therapy Procedures	Geoffrey S. Ibbott, PhD
Katie Hulme	2009	Consideration for Computed Tomography Dose Reduction in 99mTc SPECT/CT Protocols	S. Cheenu Kappadath, PhD
Joseph Dick	2010	An Implantable MOSFET Dosimeter Modified to Act as a Fiducial Marker	Mohammad Salehpour, PhD
David Zamora	2010	Thoracic Target Volume Delineation using Various Maximum-Intensity Projection Computed Tomography Image Sets for Stereotactic Body Radiation Therapy	Tinsu Pan, PhD
James Kerns	2010	Characterization of Optically-Stimulated Luminescent Detectors in Photon and Proton Beams for Use in Anthropomorphic Phantoms	Geoffrey S. Ibbott, PhD
Kelly Kisling	2010	Volumetric Modulated Arc Therapy Evaluation with the Radiological Physics Center Head and Neck Phantom	Rebecca Howell, PhD
Derek Yaldo	2010	Evaluation of the Sensitivity of the Anisotropic Analytical Algorithm (AAA) to the Commissioning Dataset	Rebecca Howell, PhD
Brad Lofton	2010	New Tools for Monitoring Gamma Camera Uniformity	Richard E. Wendt III, PhD
Anthony Blatnica	2011	Modification and Implementation of the RPC Heterogeneous Thorax Phantom for Verification of Proton Therapy Treatment Procedures	Geoffrey S. Ibbott, PhD

S.M.S. Graduate	Year	Thesis	Advisor
Sarah Joy Castillo	2011	Assessment of Collimator Jaw Optimization in Reducing Normal Tissue Irradiation with Intensity Modulated Radiation Therapy	Peter Balter, PhD
Kiley Pulliam	2011	The Clinical Impact of Couch Top and Rails on IMRT and Arc Therapy	Stephen Kry, PhD
Emily Neubauer Sugar	2011	The Effect of Shoulder Variation on IMRT and Smart Arc for Head and Neck Cancer	Stephen Kry, PhD
Jonathon Mueller	2011	In-Vivo CT Dosimetry during Virtual Colonoscopy	Dianna Cody, PhD
Paige Summers Taylor	2011	The Development and Implementation of an Anthropomorphic Head Phantom for the Assessment of Proton Therapy Treatment Procedures	Geoffrey S. Ibbott, PhD
Jacqueline Tonigan Faught	2011	Evaluation of Intensity Modulated Radiation Therapy (IMRT) Delivery Error Due to IMRT Treatment Plan Complexity and Improperly Matched Dosimetry Data	David S. Followill, PhD
Roman Repchak	2012	Evaluation of the Effectiveness of Anisotropic Analytical Algorithm in Flattened and Flattening-Filter-Free Beams for the High Energy Lung Dose Delivery using the RPC Lung Phantom	David S. Followill, PhD
Kevin Casey	2012	Development and Implementation of a Remote Audit Tool for High Dose Rate (HDR) 192Ir Brachytherapy using Optical Stimulated Luminescence Dosimetry *Blanchard Award*	David S. Followill, PhD
Jared Ohrt	2012	Comprehensive Calculation-Based IMRT QA using R&V Data, Treatment Records, and a Second Treatment Planning System	Peter Balter, PhD
Jennelle Bergene	2012	Development and Implementation of the Use of Optically Stimulated Luminescent Detectors in the Radiological Physics Center Anthropomorphic Quality Assurance Phantoms	David S. Folllowill, PhD
Michael Silosky	2012	Characterization of the Count Rate Performance and Evaluation of the Effects of High Count Rates on Modern Gamma Cameras	S. Cheenu Kappadath, PhD
Kevin Vredevoogd	2012	Evaluation of Polymer Gel Dosimeters for Measurements of Dose and LET in Proton Beams	Geoffrey S. Ibbott, PhD
Yi Pei Patty Chen	2012	Comparison of Tumor Shrinkage and Cumulative Dose Distribution for Lung Cancers	Laurence E. Court, PhD

S.M.S. Graduate	Year	Thesis	Advisor
James Neihart	2013	Development and Implementation of a Dynamic Heterogeneous Proton Equivalent Anthropomorphic Thorax Phantom for the Assessment of Scanned Proton Beam Therapy	David S. Followill, PhD
Olivia Huang Dawood	2013	Evaluation of PRESAGE® Dosimeters for Brachytherapy Sources and the 3D Dosimetric Characterization of the new AgX100 125I Seed Model	Geoffrey S. Ibbott, PhD
Christopher Pham	2013	Characterization of OSLDs for Use in Small Field Photon Beam Dosimetry	David S. Followill, PhD
Elizabeth McKenzie Boehnke	2013	An Evaluation of the Consistency of IMRT Patient QA Techniques	Stephen Kry, PhD
Katherine Dextraze	2013	Renal Cryoablation: Investigation of Periprocedural Visualization Tools and Treatment Response Quantification	Jason Stafford, PhD
Matthew J. S. Wait	2014	Performance Evaluation of Material Decomposition using Rapid kVp-Switching Dual Energy CT for Assessing Bone Mineral Density	S. Cheenu Kappadath, PhD
Ming Jung Mindy Hsieh	2014	Implementation of Upright Treatments for Lung and Head and Neck Cancers	Laurence E. Court, PhD
Jennifer Sierra Irwin	2014	Characterization of the New Xoft Axxent Electronic Brachytherapy Source using PRESAGE®	Geoffrey S. Ibbott, PhD
Dana Lewis	2014	Development and Implementation of an Anthropomorphic Pediatric Spine Phantom for the Assessment of Craniospinal Irradiation Procedures in Proton Therapy	Stephen Kry, PhD
Olivia Popnoe	2015	Feasibility of Using Virtual Unenhanced Images to Replace Pre-Contrast Images in Multiphase Renal CT Exams	A. Kyle Jones, PhD
Mattie McInnis	2015	Assessment of Uncertainty in Planning and Dose Delivery of Proton Therapy in IROC-Houston QA Phantom Due to Variable CT Technique and Proton Energy	David S. Followill, PhD
Daniela Branco	2016	Development and Implementation of an Anthropomorphic Head and Neck Phantom for the Assessment of Proton Therapy Treatment Procedures	David S. Followill, PhD
Harlee Harrison Griffin	2016	An Automated Syringe Pump System for Improving the Reproducibility of Dynamic Hyperpolarized MR Phantoms	James Bankson, PhD
Joseph Weygand	2017	Identifying the Immune-Related Metabolic Properties of Pancreatic Cancer Using Nuclear Magnetic Resonance Spectroscopy and Dynamic Magnetic Resonance Spectroscopic Imaging with Hyperpolarized Pyruvate	Pratip K. Bhattacharya, PhD

S.M.S. Graduate	Year	Thesis	Advisor
Benjamin C. Musall	2017	Quantitative DWI as an Early Imaging Biomarker of Response to Chemoradiation in Esophageal Cancer	Steven H. Lin, PhD
Brian M. Anderson	2017	Computer-Aided Detection of Pathologically Enlarged Cervical Lymph Nodes with Non-contrast CT	Laurence E. Court, PhD
Garrett Baltz	2018	Development of 3D-Printed Patient Specific Bolus for Clinical Use in Total Scalp Irradiation	Rebecca Howell, PhD
Mary Peters	2018	Development and Commissioning of an Independent Peer Review System for a Small Animal Irradiator	Rebecca Howell, PhD
Laura C. Bennett	2018	Stereotactic Radiotherapy for Spinal Metastases Using Flattening Filter Free Beams	Oleg Vassiliev, PhD
Brandon Luckett	2019	Commissioning of Micro-Cube Thermoluminescent Dosimeters for Small Field Dosimetry Quality Assurance in Radiotherapy	Paige A. Taylor, MS
Shannon E. Hartzell	2019	Quantifying Uncertainty in a Measurement-Based Assessment of Relative Biological Effectiveness in Carbon Ion Therapy	Stephen Kry, PhD
Aashish C. Gupta	2021	Advancement of a 3D Computational Phantom and Its Age Scaling Methodologies for Retrospective Dose Reconstruction of Childhood Cancer Survivors Treated with Radiotherapy	Rebecca M. Howell, PhD
Rebecca DiTusa	2021	Investigation of Trophon® 2 for High-Level Disinfection of Rigid Endorectal MRI Coils	James Bankson, PhD

ALUMNI – MASTER OF SCIENCE

M.S. Graduate	Year	Dissertation	Advisor
Peter Corry	1966	Development of a Scintillation Camera for Visualization of Distributions of Radioactive Isotopes	Arthur Cole, PhD
E. Burnell Hranitzky	1969	Relative Merits of Systems for Measurement of Ion Chamber Current from Radiation Sources	Peter Almond, PhD
Dale Campbell	1971	A Comparison Study of Three RANDO Phantoms and an Absorbed Dose Calculation for Media Containing Air Cavities	Peter Almond, PhD
Kenneth McCray	1971	Investigation of the Energy Dependence and Supralinearity Characteristics of Lithium Fluoride, Calcium Fluoride, and Lithium Borate Thermoluminescent Dosimeters	Peter Almond, PhD
Samuel Hancock	1971	Measurement of Mean Quality Factor by LET Spectroscopy	George Oliver, PhD
Charles Kahlig	1973	A Comparison of Methods Used to Generate Isodose Distributions for Cobalt-60 Radiation	Robert J. Shalek, PhD
Laurence Thomson	1974	Response of a Human Melanoma Cell Line to High LET Radiation	Alfred R. Smith, PhD
L. David Gager	1975	Investigation of Silicon Diode Suitability for Use in Radiological Physics Measurements	Peter Almond, PhD
Steven Rosanky	1975	The Gamma Dose for 50 MEV d>Be Neutrons at Tamvec	Peter Almond, PhD
James R. Marbach	1975	The Effect of Scattered Photons on the 25 MV Photon Beam from a Sagittaire Linear Accelerator	Peter Almond, PhD
Tariq Mian	1975	Effects of Radiation from Radionuclides on Mouse Testis Cells	Marvin Meistrich, PhD
David Ta-Wei Huang	1975	Three-Dimensional Dose Computations for External Beam Radiation Therapy	Robert J. Shalek, PhD
Elwood Armour	1976	The Response of Melanized and Non-Melanized Tissue Culture Cells to Combined Ultrasound and Drug Treatments	Peter Corry, PhD
Amparo Mendez	1977	CA and CE Dependence on the Chamber Wall Material as a Function of Beam Energy	Peter Almond, PhD
Jose Antonio BenComo	1978	The Effect of Reciprocity Law Failure When Determining the Characteristic Curve for Screen Film Systems	Alfonso Zermeno, PhD
Charles Lazarre	1980	A Study of the Efficacy of Stannous Diphosphonates in Labeling Rabbit Erythrocytes with Technetium-99m	Howard Glenn, PhD
Walter Jenkins	1983	Enhancement of Radiation-Induced DNA Strand Breaks in the Normal Tissues of Mice Exposed to Hypoxic Cell Sensitizers	Raymond Meyn, PhD
Steven M. Kirsner	1986	Advanced Radiation Therapy Techniques for Retinoblastoma	Kenneth R. Hogstrom, PhD

M.S. Graduate	Year	Dissertation	Advisor
Allen D. Green	1991	Modeling of Dual Foil Scattering Systems for Clinical Electron Beams	Kenneth R. Hogstrom, PhD
Usman Qazi	1995	Evaluation of a Quadruple Energy Window Scatter Subtraction Algorithm for Anger Camera Imaging	Daniel J. Macey, PhD
Robin L. Kendall	1996	Dose-Escalation Potential of Intensity-Modulated Conformal Therapy for Lung Cancer	Isaac I. Rosen, PhD
Robert A. Boyd	1998	The Effect of Using an Initial Polyenergetic Spectrum with the Electron Pencil-Beam Redefinition Algorithm	Kenneth R. Hogstrom, PhD
Nicholas G. Zacharopoulos	1998	MR Diffusion Tensor Imaging of Normal Human Brain with Selective Tissue Suppression	Ponnada Narayana, PhD
Shannon M. Bragg-Sitton	1999	Assessment of the Reliability and Reproducibility of Functional Magnetic Resonance Imaging for Selected Cognitive Tasks	Edward F. Jackson, PhD
Kent A. Gifford	2000	Verification of a Commercial Radiation Treatment Planning System	George Starkschall, PhD
Brent C. Parker	2001	Quantification of Uncertainties for PTV Margin Determination in Conformal Stereotactic Radiotherapy of Intracranial Lesions *Blanchard Award*	Almon S. Shiu, PhD
Theodore R. Steger, III	2001	Implementation and Verification of Techniques for Real-Time Analysis and Clinical Distribution of Functional Magnetic Resonance imaging Data	Edward F. Jackson, PhD
Aziz H. Poonawalla	2002	Technical Development and Optimization of Clinical Magnetic Resonance Tractography	X. Joe Zhou, PhD
Rebecca Millman Marsh	2003	Measuring Cell Volume Fraction with High-Resolution Diffusion Weighted Magnetic Resonance Imaging	X. Joe Zhou, PhD
Stephen Kry	2003	Secondary Dose Equivalent from IMRT Treatments *Blanchard Award*	Mohammad Salehpour, PhD
Michael J. Price	2004	Modification of the Pencil-Beam Redefinition Algorithm to Predict Central-Axis Percent Depth Dose for Rectangular Fields	Kenneth R. Hogstrom, PhD
Robert A. Rodgers	2005	Electron Conformal Radiotherapy for Post-Mastectomy Irradiation: A Bolus-Free Multi-Energy, Multi-Segmented Field Algorithm	John A. Antolak, PhD
Malcolm E. Heard	2005	Characterizing Dose Distributions of Brachytherapy Sources Using Normoxic Gel	Geoffrey S. Ibbott, PhD

M.S. Graduate	Year	Dissertation	Advisor
Jason Shoales	2005	Development of an Independent Audit Device for Remote Verification of 4D Radiotherapy *Blanchard Award*	David S. Followill, PhD
Jonas David Fontenot	2006	Dose per Monitor Unit Determination for Proton Therapy Treatment Portals with and without the Range Compensator	Wayne D. Newhauser, PhD
Adam Melancon	2006	The Dosimetric Impact of Intrafractional Motion on IMRT Treatment of Prostate Cancer	Lei Dong, PhD
Dustin Ragan	2006	Partial Fourier Image Reconstruction for Efficient Water and Fat Separation in MR	Jingfei Ma, PhD
Whitney Bivens Warren	2007	Evaluation of Bang® Polymer Gel Dosimeters in Proton Beams	Geoffrey S. Ibbott, PhD
Richard Castillo	2007	CT-Based Pulmonary Compliance Imaging in Rodents	Thomas Guerrero, MD, PhD
William Michael Bradley	2007	Partial Volume Correction of Lung Nodules Using PET/CT	Osama Mawlawi, PhD
Jaclyn Homnick	2008	Evaluation of Aluminum Oxide (Al_2O_3:C) Optically Stimulated Luminescence (OSL) Dosimeters as a Potential Alternative to Thermoluminescent Dosimeters (TLDs) for Remote Dosimetry Services	Geoffrey S. Ibbott, PhD
Annelise Giebeler	2009	Patient-Specific Monitor Unit Determination for Patients Receiving Proton Therapy	Wayne Newhauser, PhD
Douglas Caruthers	2010	Commissioning an Anthropomorphic Spine and Lung Phantom for the Remote Validation of Institutions Participating in RTOG 0631	Geoffrey S. Ibbott, PhD
Adam Springer	2010	Evaluation of the Quantitative Accuracy of a Commercially-Available Positron Emission Mammography Scanner	Osama Mawlawi, PhD
Laura Rechner	2011	Risk of Second Malignant Neoplasms Following Arc Therapy and Volumetric Modulated Arc Therapy for Prostate Cancer	Wayne Newhauser, PhD
Luke Hunter	2013	Radiomics of NSCLC: Quantitative CT Image Feature Characterization and Tumor Shrinkage Prediction *Blanchard Award*	Laurence E. Court, PhD
Gye Won Diane Choi	2016	Measurement of the Electron Return Effect Using Presage Dosimeters	Geoffrey S. Ibbott, PhD

ALUMNI – DOCTOR OF PHILOSOPHY

Ph.D. Graduate	Year	Dissertation	Advisor
Robert Waggener	1966	Induction Sensitivity, Cell Survival Following UV Irradiation and DNA Synthesis in a Synchronized Population of E. Coli FK-12(gamma) Cells: A Dissertation	Robert J. Shalek, PhD
Max Boone	1968	High Energy Electron Dose Perturbations in Regions of Tissue Heterogeneity	Robert J. Shalek, PhD
Alfonso Zermeno	1968	The Radiosensitivity of Synchronized Mammalian Cells to Low-Velocity Electrons	Arthur Cole, PhD
Ann Wright	1970	Kinetics of Catalase Activity in Solution and in a Lipoprotein Complex and the Relative Response to Ionizing Radiation	Peter Almond, PhD
Bhudatt Paliwal	1973	A Comparative Study of the Burlin and Almond Cavity Theories for a Lithium Fluoride Cavity in a Polystyrene Medium for Electron Beams Used in Radiation Therapy	Peter Almond, PhD
Royce Gragg	1974	Response of Chinese Hamster Ovary Cells to Fast Neutron Radiotherapy Beams	Raymond Meyn, PhD
Dwight Glenn	1975	"W" Value for Cyclotron Neutrons	Peter Almond, PhD
James Chien-hua Chu	1978	A Clinical Liquid Ionization Chamber for Mixed Neutron Field Dosimetry	Walter Grant, III, PhD
James R. Marbach	1978	Optimization Parameters for Field Flatness and Central-Axis Depth Dose for Use in Design of Therapy Electron Beam Generators	Peter R. Almond, PhD
Carlos E. de Almeida	1979	Energy and Spectrum Measurements of High Energy Electrons Using a Cerenkov Detector	Peter R. Almond, PhD
Thomas H. Kirby	1980	Origin of Residual Potential in Amorphous Selenium Photoreceptors	Alfonso Zermeno, PhD
Amparo Marles	1981	Comparison of Measurement of Absorbed Dose to Water Using a Water Calorimeter and Ionization Chambers of Clinical Radiotherapy Photon Electron Beams	Peter R. Almond, PhD
Jose A. BenComo	1982	Study of the Effects of Total Modulation Transfer Function Changes on Observer Performance Using Clinical Mammograms	Dennis A. Johnston, PhD
Benjamin R. Archer	1984	A Laplace Transform Pair Model to Determine Bremsstrahlung Spectra from Attenuation Data	Peter R. Almond, PhD
David E. Mellenberg	1985	Measurement of Tumor Blood Flow Following Neutron Irradiation	Kenneth R. Hogstrom, PhD
Patrick M. Stafford	1987	Nuclear Track Detector Material as a Fast Neutron Microdosimeter	Peter R. Almond, PhD
Almon S. Shiu	1988	Three-Dimensional Electron Beam Dose Calculations	Kenneth R. Hogstrom, PhD
John D. Hazle	1989	In Vivo Magnetic Resonance Studies of Experimental Liver Disease: Carbon Tetrachloride Hepatoxicity and Alcohol-Induced Fatty Liver in Rat	Ponnada A. Narayana, PhD

Ph.D. Graduate	Year	Dissertation	Advisor
Edward F. Jackson	1990	A Dual Resonance, Image-Guided Volume Localization Technique for Magnetic Resonance Spectroscopy	Ponnada A. Narayana, PhD
Michael F. Moyers	1991	A Convolution Model for Energy Transport in a Therapeutic Fast Neutron Beam	John L. Horton, PhD
David S. Followill	1991	The Development and Characterization of Two Types of Chronic Responses in Irradiated Mouse Colon	Elizabeth Travis, PhD
John E. Bayouth	1993	Dosimetric Evaluation of Bone Marrow Ablation Using Radionuclide Therapy	Daniel J. Macey, PhD
Huan B. Giap	1994	Development of a SPECT-Based Three-Dimensional Treatment Planner for Radionuclide Therapy with I-131	Daniel J. Macey, PhD
James C. Falconer	1995	Quantitative MRI of Spinal Cord Injury in a Rat Model: Correlative Studies	Ponnada A. Narayana, PhD
Lei Dong	1995	Development of Automated Image Analysis Tools for Verification of Radiotherapy Field Accuracy with an Electronic Portal Imaging Device	Arthur L. Boyer, PhD
Steven P. McCullough	2000	A Novel Treatment Planning Methodology for High Dose ^{166}Ho-DOTMP Therapy in Patients with Multiple Myeloma *Blanchard Award*	Richard E. Wendt III, PhD
Robert A. Boyd	2001	Pencil-Beam Redefinition Algorithm Dose Calculations for Electron Therapy Treatment Planning	Kenneth R. Hogstrom, PhD
R. Jason Stafford	2002	Fast Magnetic Resonance Temperature Imaging for Focused Ultrasound Thermal Therapy *Blanchard Award*	John D. Hazle, PhD
Peter Balter	2003	Imaging Properties of Scanning Equalization Digital Radiography: A Simulation Study	Chris C. Shaw, PhD
Brent C. Parker	2004	Verification of Intensity Modulated Stereotactic Radiotherapy Using Monte Carlo Calculations and EPID Dosimetry	Almon S. Shiu, PhD
Kent A. Gifford	2004	A 3-D CT Assisted Monte Carlo Evaluation of Intracavitary Implants *Blanchard Award*	John L. Horton, PhD
Nathan Childress	2004	The Design and Evaluation of a 2D Verification System for Intensity Modulated Radiotherapy	Isaac I. Rosen, PhD
Theodore R. Steger, III	2004	Investigation of Arterial Spin Labeling MRI for Quantitative Cerebral Blood Flow Measurement	Edward F. Jackson, PhD
Aziz H. Poonawalla	2005	Multiple Gradient Echo Propeller (MGREP): Technical Development and Potential Applications	X. Joe Zhou, PhD
Dawn Cavanaugh	2005	Assessment of Cone Beam Computed Tomography Techniques for Imaging Lung Damage in Mice in Vivo	Dianna Cody, PhD
Nicholas C. Koch	2006	Monte Carlo and Analytical Dose Calculations for Ocular Proton Therapy	Wayne Newhauser, PhD

Ph.D. Graduate	Year	Dissertation	Advisor
Jennifer C. O'Daniel	2006	Image-Guided Adaptive Radiotherapy for Prostate and Head-and-Neck Cancers *Blanchard Award*	Lei Dong, PhD
Stephen Kry	2007	The Development and Validation of a Monte Carlo Model for Calculating the Out-of-Field Dose from Radiotherapy Treatments *Blanchard Award*	Mohammad Salehpour, PhD
Rebecca Millman Marsh	2007	Measuring Treatment Response in Irradiated Murine Tumors with Diffusion-Weighted Magnetic Resonance Imaging	John D. Hazle, PhD
Christopher Nelson	2007	Reduction of Tumor Motion and Setup Uncertainties in the Radiation Therapy of Lung Tumors	George Starkschall, PhD
Pai-Chun Melinda Chi	2007	Thoracic Cancer Imaging with PET/CT in Radiation Oncology	Tinsu Pan, PhD
Rebecca Weinberg	2007	Electron Intensity Modulation for Mixed-Beam Radiation Therapy with an X-ray Multi-Leaf Collimator	John A. Antolak, PhD
Jonas Fontenot	2008	Proton Therapy versus Intensity Modulated X-ray Therapy in the Treatment of Prostate Cancer: Estimating Secondary Cancer Risks *Blanchard Award*	Wayne Newhauser, PhD
Michael J. Price	2008	The Imaging and Dosimetric Capabilities of a CT/MR Suitable Anatomically Adaptive, Shielded Intracavitary Brachytherapy Applicator for the Treatment of Cervical Cancer	Firas Mourtada, PhD
Kishore Venkata Mogatadakala	2008	In Vivo Diffusion Tensor Imaging of a Rat Spinal Cord with a Phased Array Coil at 7T	Ponnada A. Narayana, PhD
Malcolm E. Heard	2009	Identification and Characterization of an Optimal Three-Dimensional Dosimetry System for Remote Auditing by the RPC *Blanchard Award*	Geoffrey S. Ibbott, PhD
Dustin Ragan	2010	Measurement of the Vascular Input Function in Mice for DCE-MRI	James Bankson, PhD
Adam Melancon	2010	Range Adaptive Proton Therapy for Prostate Cancer	Lei Dong, PhD
Adam Riegel	2010	Thoracic Radiotherapy Treatment Planning with Cine PET/CT	Tinsu Pan, PhD
Blake Cannon	2010	Improving Quantitative Treatment Response with Deformable Image Registration	Lei Dong, PhD
Brian Taylor	2010	Dynamic Chemical Shift imaging for Usage-Guided Thermal Therapy *Blanchard Award*	R. Jason Stafford, PhD
Scott Davidson	2010	Benchmarking and Implementation of a New Independent Monte Carlo Dose Calculation Quality Assurance Audit Tool for Clinical Trials	David S. Followill, PhD
Ming Yang	2011	Dual Energy Computed Tomography for Proton Therapy Treatment Planning	Lei Dong, PhD

Ph.D. Graduate	Year	Dissertation	Advisor
Rui Zhang	2011	Quantitative Comparison of Late Effects Following Photon versus Proton External-Beam Radiation Therapies: Toward an Evidence-Based Approach for Selecting a Treatment Modality	Wayne Newhauser, PhD
Richard Castillo	2011	Evaluation of Deformable Image Registration for Improved 4D CT-Derived Ventilation for Image-Guided Radiotherapy *Blanchard Award*	Thomas Guerrero, MD, PhD
Yevgeney Vinogradskiy	2011	Improving the Accuracy of Radiation Pneumonitis Dose Response Model	Mary K. Martel, PhD
Annelise Giebeler	2011	The Role of Cell Sterilization in Population-Based Studies of Radiogenic Second Cancers Following Radiation Therapy	Wayne Newhauser, PhD
Yoshi Tsunashima	2011	Verification of the Clinical Implementation of the Respiratory-Gated Beam Delivery Technique with Synchrotron-Based Proton Irradiation	X. Ronald Zhu, PhD
Cheuk Kai Becket Hui	2012	Improved Techniques for Acquisition and Analysis of Dynamic Contrast-Enhanced Magnetic Resonance Imaging for Detecting Vascular Permeability in the Central Nervous System	Ponnada A. Narayana, PhD
Vaibhav Juneja	2012	Novel Phantoms and Post-Processing for Diffusion Spectrum Imaging	Ponnada A. Narayana, PhD
Sarah Scarboro	2012	Understanding the Influence of Photon Energy on 6 MV Non-Reference Dosimetry Using TLD and OSLD	Stephen Kry, PhD
Chad Bircher	2012	Design, Calibration and Evaluation of Depth-of-Interaction-Capable PET Detector Modules	Yiping Shao, PhD
Moiz Ahmad	2012	Design and Optimization of Four-Dimensional Cone-Beam Computed Tomography in Image-Guided Radiation Therapy	Tinsu Pan, PhD
Peter Park	2012	Development of Beam-Specific Planning Target Volume and Robust Plan Analysis Tool for Proton Therapy	X. Ronald Zhu, PhD
Zhiqian Henry Yu	2013	Improving Cervical Cancer Nodal Boost Radiation Therapy by Quantifying Uncertainties and Exploring Advanced Radiation Therapy Modalities	Rajat Kudchadker, PhD
Kenneth Homann	2013	Radiogenic Second Cancer Risk Differences in Female Hodgkin Lymphoma Patients Treated with Proton versus Photon Radiotherapies	Rebecca Howell, PhD
Jason E. Matney	2013	Investigation of Respiratory Motion Management Techniques for Proton and Photon Radiotherapy of Lung Cancer	Radhe Mohan, PhD
John G. Eley	2013	Scanned Ion Beam Therapy for Thoracic Tumors *Blanchard Award*	Wayne Newhauser, PhD
Jongmin Cho	2014	Use of Positron Emission Tomography for Proton Therapy Verification	Geoffrey S. Ibbott, PhD

Ph.D. Graduate	Year	Dissertation	Advisor
Adam Yock	2014	Forecasting Longitudinal Changes in Oropharyngeal Tumor Volume, Position and Morphology during Image-Guided Radiation Therapy	Laurence E. Court, PhD
Ryan J. Bosca	2014	Methodological Development of a Multi-Parametric Quantitative Imaging Biomarker Framework for Assessing Treatment Response with MRI	R. Jason Stafford, PhD
Sarah Joy Castillo	2014	Evaluation of Artifacts in Experimental 4D CT Acquisition Methods	Thomas Guerrero, MD, PhD
Joey P. Cheung	2014	Image-Guided Proton Therapy for Online Dose-Evaluation and Adaptive Planning	Laurence E. Court, PhD
Daniel Robertson	2014	Volumetric Scintillation Dosimetry for Scanned Proton Beams *Blanchard Award*	A. Sam Beddar, PhD
Austin Faught	2014	Development of a New Independent Monte Carlo Dose Calculation Quality Assurance Audit Tool for Clinical Trials	David S. Followill, PhD
Joshua Yung	2014	Stochastic Data Assimilation Approaches for Magnetic Resonance Temperature Imaging	John D. Hazle, PhD
Landon Wooton	2014	In vivo Dosimetry using Plastic Scintillation Detectors for External Beam Radiation Therapy	A. Sam Beddar, PhD
Jessica Nute	2015	Characterization of Low Density Intracranial Lesions Using Dual-Energy Computed Tomography	Dianna Cody, PhD
Jessie Huang-Vredevoogd	2015	Reduction of Dose Calculation Errors for Patients with Metal Implants Receiving Photon Radiation Therapy	Stephen Kry, PhD
Jacqueline Tonigan Faught	2015	Quantification of IMRT Severity Scores for Improvement of FMEA Results	David S. Followill, PhD
Daniel Smith	2015	Prophylactic Cranial Irradiation Reduces the Incidence of Brain Metastasis in a Mouse Model of Metastatic Breast Cancer	Wendy Woodward, MD, PhD
Hua Asher Ai	2015	Improving Attenuation Correction in Hybrid Positron Emission Tomography	Richard E. Wendt III, PhD
Ryan Grant Lafratta	2015	Quality Assurance of Advanced Modalities Using PRESAGE Dosimeters	Geoffrey S. Ibbott, PhD
Samuel Fahrenholtz	2015	Prediction of Laser Ablation in Brain: Sensitivity, Calibration and Validation	R. Jason Stafford, PhD
Justin K. C. Mikell	2015	Voxel-Level Absorbed Dose Calculations with a Deterministic Grid-Based Boltzmann Solver for Nuclear Medicine and the Clinical Value of Voxel-Level Calculations *Blanchard Award*	S. Cheenu Kappadath, PhD
David V. Fried	2015	Investigation of Quantitative Image Features from Pretreatment CT and FDG-PET Scans in Stage III NSLC Patients Undergoing Definitive Radiation Therapy	Laurence E. Court, PhD

Ph.D. Graduate	Year	Dissertation	Advisor
James R. Kerns	2016	Identifying Treatment Planning System Errors in IROC-Houston Head and Neck Phantom Irradiations	Stephen Kry, PhD
Tze Yee Lim	2016	Encapsulated Contrast Agent Markers for MRI-Based Post-Implant Dosimetry	Rajat Kudchadker, PhD
Shane P. Krafft	2016	Utilizing Computed Tomography Image Features to Advance Prediction of Radiation Pneumonitis	Mary K. Martel, PhD
Christopher R. Peeler	2016	Assessing the Potential Clinical Impact of Variable Biological Effectiveness in Proton Radiotherapy *Blanchard Award*	Radhe Mohan, PhD
Wendy "Siman" Siman	2016	Bias and Variability in Image-Based Volumetric Yttrium-90 Dosimetry	S. Cheenu Kappadath, PhD
Joshua S. Niedzielski	2016	Investigation of Radiation Injury in the Esophagus from Definitive Chemoradiation Therapy Using Novel Imaging Biomarkers	Laurence E. Court, PhD
Christopher M. Walker	2016	Novel Simulation to Avoid Bias in Measurement of Hyperpolarized Pyruvate: Demonstrated in Phantom and in Vivo	James Bankson, PhD
Christopher J. MacLellan	2016	Determination of Thermal Dose Model Parameters Using Magnetic Resonance Imaging	R. Jason Stafford, PhD
Shuaiping Ge	2017	Improvements in Robustness and Optimality with 4-Dimensional Robust Optimization of Intensity-Modulated Proton Therapy Plans for Lung Cancer Patients	Radhe Mohan, PhD
Ashley E. Rubinstein	2017	A Preclinical Study of Radiation-Induced Lung Toxicity When Irradiating in a Strong Magnetic Field	Laurence E. Court, PhD
W. Scott Ingram	2017	Image Registration to Map Endoscopic Video to Computed Tomography for Head and Neck Radiotherapy Patients	Laurence E. Court, PhD
Xenia Fave	2017	Detecting and Evaluating Therapy-Induced Changes in Radiomics Features Measured from Non-small Cell Lung Cancer to Predict Patient Outcomes *Blanchard Award*	Laurence E. Court, PhD
Lawrence Bronk	2017	High Throughput Mapping of Particle Therapy Biological Effects	David R. Grosshans, MD
Rachael M. Martin	2017	Improvements in Four-Dimensional and Dual Energy Computed Tomography	Tinsu Pan, PhD
Hannah J. Lee	2017	Volumetric, Magnetic Resonance-Visible, and Radiation-Sensitive Detectors for Magnetic Resonance Image-Guided Radiation Therapy	Geoffrey S. Ibbott, PhD
Daniel F. Craft	2018	Design, Fabrication and Validation of 3D Printed, Patient-Specific Compensators for Postmastectomy Radiation Therapy	Rebecca Howell, PhD

Ph.D. Graduate	Year	Dissertation	Advisor
Rachel E. McCarroll	2018	Equipment to Address Infrastructure and Human Resource Challenges for Radiotherapy in Low-Resource Settings	Laurence E. Court, PhD
Megan Jacobsen	2018	Identification of Intracranial Lesions with Dual-Energy Computed Tomography and Magnetic Resonance Phase Imaging *Blanchard Award*	Dianna Cody, PhD
Angela Steinmann	2018	Development and Implementation of a Homogeneous and Heterogeneous Anthropomorphic End-to-End Quality Assurance Audit System Phantom for Magnetic Resonance Guided Radiotherapy Modalities Ranging from 0.35 T to 1.5 T	David S. Followill, PhD
Carlos E. Cardenas	2018	Auto-Delineation of Oropharyngeal Clinical Target Volumes Using Deep Learning Models	Laurence E. Court, PhD
Mitchell Carroll	2018	Evaluation of Presage as a 3D Dose Verification Tool in Proton Beams	Geoffrey S. Ibbott, PhD
Sara L. Thrower	2018	A Compressed Sensing Approach to Detect Immobilized Nanoparticles Using Superparamagnetic Relaxometry	John D. Hazle, PhD
Fahed Alsanea	2018	3D Scintillation Detector Quenching Characterization for Scanning Proton Beams	Sam Beddar, PhD
Rachel B. Ger	2019	Quantitative Imaging for Precision Medicine in Head and Neck Cancer Patients	Laurence E. Court, PhD
Kelly D. Kisling	2019	Development of Automated Radiotherapy Treatment Planning for Cervical and Breast Cancer for Resource-Constrained Clinics	Laurence E. Court, PhD
Mark A. Newpower	2019	Modeling Proton Relative Biological Effectiveness Using Monte Carlo Simulations of Microdosimetry	Radhe Mohan, PhD
Drew Mitchell	2019	An Information Theory Model for Optimizing Quantitative MRI Acquisitions *Blanchard Award*	David Fuentes, PhD
Joseph G. Meier	2019	Assessment of New Innovations in PET/CT for Respiratory Motion Correction	Osama Mawlawi, PhD
Jeremiah Sanders	2020	Development of Fully Balanced SSFP and Computer Vision Applications for MRI-Assisted Radiosurgery (MARS)	Jingfei Ma, PhD
Kristine Ferrone	2020	Active Magnetic Radiation Shielding for Long-Duration Human Spaceflight	Stephen Kry, PhD
Daniela Branco	2020	Development of a CT Metal Artifact Management Algorithm for Proton Therapy Planning (AMPP) for Head and Neck Cancer Patients	David S. Followill, PhD
Mallory Carson Glenn	2020	Characterization of Treatment Planning System Photon Bean Modeling Errors in IROC-Houston Phantom Irradiations	Stephen Kry, PhD
Joshua Gray	2020	Directed Evolution of Macrocyclic Peptides for Inhibition of Autophagy	Steven Millard, PhD

Ph.D. Graduate	Year	Dissertation	Advisor
Maureen Aliru	2020	Nuclear-Targeted Gold Nanoparticles Enhance the Effects of Radiation Therapy with and without Liposomal Delivery	Sunil Krishnan, MD
Travis Salzillo	2020	The Use of Magnetic Resonance Imaging and Spectroscopy to Interrogate the Metabolism of Brain Cancer and Associated Immune Cells Throughout the Course of Tumor Progression *Blanchard Award*	Pratip Bhattacharya, PhD
Keith Michel	2020	Hyperpolarized Carbon-13 Magnetic Resonance Measurements of Tissue Perfusion and Metabolism	James A. Bankson, PhD
David Flint	2021	The Importance of DNA Repair Capacity to (and a Model to Predict) Cell Radiosensivity to Ions	Gabriel Sawakuchi, PhD
Trevor M. Mitcham	2021	Development of Quantitative Ultrasound-Mediated Molecular Imaging of the Tumor Microenvironment	Richard R. Bouchard, PhD
Cayla A. W. Zandbergen	2021	Development of Quantitative Molecular Acoustic Imaging for Noninvasive Cancer Diagnostics	Richard R. Bouchard, PhD
Tucker Netherton	2021	A Fully-Automated, Deep Learning-Based Framework for Computer Tomography-Based Localization, Verification, and Treatment Planning of Metastatic Vertebrae	Laurence E. Court, PhD
Evan Gates	2021	Imaging Based Prediction of Pathology in Adult Diffuse Glioma with Applications to Therapy and Prognosis	David Fuentes, PhD
Brian Anderson	2021	Improving Treatment of Local Liver Ablation Therapy with Deep Learning and Biomechanical Modeling	Kristy K. Brock, PhD
Benjamin C. Musall	2021	Quantitative Magnetic Resonance Imaging for the Prediction of Treatment Response in Triple Negative Breast Cancer	Jingfei Ma, PhD
Dong Joo Rhee	2021	Automation of Radiation Treatment Planning for Cervical Cancer	Laurence E. Court, PhD
Brigid McDonald	2022	Development of Advanced MR-Guided Adaptive Radiation Therapy Methods for Head and Neck Cancers on the 1.5T MR-Linac	Clifton D. Fuller, MD, PhD
Emily Thompson	2022	Hepatocellular Carcinoma (HCC) Image Guided Intervention: Quantitative Characterization of Thermochemical Ablation	Erik N. K. Cressman, PhD, MD
Benjamin Lopez	2022	Absolute Quantification of Tc-99m Uptake with Molecular Breast Imaging	S. Cheenu Kappadath, PhD