INTRODUCTION

Welcome to the Graduate Program in the Medical Sciences (MDS). The purpose of this handbook is to introduce you to the curricula, policies and requirements that must be met to earn either a Master of Science (M.S.), or Doctor of Philosophy (Ph.D.) degree in MDS from the Graduate College of The University of Arizona. The Medical Sciences Graduate Program is designed to provide a timely, convenient mechanism for M.D. residents to learn and earn a graduate degree – either an MS (Master of Science) or a PhD (Doctor of Philosophy) – during their residency training years, so that interested individuals stay connected with both clinical and research advances in their field, while jump-starting their academic careers. The educational experience, publications and additional credential of an M.S. or a Ph.D. adds a significant advantage for residents in applying for future fellowships and faculty appointments. Earning a graduate research degree during the residency years is particularly advantageous because a mid-level resident has chosen their field of specialization, their clinical research interests are more developed and focused.

The MDS Graduate Program was inaugurated in the Department of Surgery and was approved by the UA Board of Regents in April, 2009. The first MDS students from the Department of Surgery were enrolled that summer. In order to encourage participation by other Residencies, all clinical departments in UACOM are eligible and encouraged to recruit students. The home department is expected to financially support their residents who enter the MDS Program.

Timely completion of this graduate program necessitates pro-active coordination of each graduate student with their mentor, the MDS Director of Graduate Studies, the MDS Program Coordinator and the Graduate College. This handbook should be read carefully and completely upon entering the Program, and used henceforth as a reference regarding the policies and procedures of the Medical Sciences Program at The University of Arizona.

The Program is intended to provide the foundation for a research career in the Medical Sciences. To achieve this aim, the student requires (a) an adequate base knowledge of biostatistics, grant writing, ethics and MDS courses that are specific to your medical discipline (e.g. Surgery), (b) experience and training in research, culminating in a major research project, and c) experience and training in teaching, and in presenting research findings. For the Ph.D. students, a Minor Program of Study is also required in a discipline that is relevant to your long-term scholarly goals.

The Program is designed for completion of the doctoral degree in three years, or the master’s degree in one year. Typically, the resident will enter the program mid-way through their residency program (for General Surgery after the third year of residency). Obtaining a degree within this time frame depends, in large part, on the motivation, pro-active approach, diligence and self-discipline of the graduate student. Significant preparation for the research project during the residency years prior to ‘going into the lab’ is essential. Residents who are interested in participating in the MDS Program should indicate their interest to the Director of their Residency Program and the Director of Graduate Studies during the first year of their Residency. A mentor and research project should then be identified by the student. The individual should write a Research Project proposal for submission for potential outside funding support during their second year of Residency. Application to the Program can be made up until May 5th of the school year prior to entering the Program. Because of the need to complete the Program in a timely manner, the curricula for the M.S. and Ph.D. programs are well defined, with the exception of the Minor Program of Study for Ph.D students. The Minor Program of Study is determined by the Minor Department or Graduate Program (e.g. Cancer Biology, Physiological Sciences, Immunology, etc.). Again, sincere
interest, preparation, dedication and communication are paramount to successfully completing the MDS program in the time allotted.

**MASTERS PROGRAM**

The mission of the Masters Program is to provide an avenue for the student to gain more experience in and exposure to the diverse areas of the medical sciences and to offer a mechanism for the student to obtain in-depth knowledge in a specific area of medical research. To this end, opportunities can be provided for students to participate in a specific laboratory or clinical research project in the laboratory/clinic of a Medical Sciences faculty member.

**Faculty participation**

All faculty members of the Medical Sciences Graduate Program are eligible to participate fully in the M.S. Program as committee members and as major advisors/research project directors (i.e., mentors).

**Curriculum**

For the Department of Surgery*, the required courses are:

- **Principles of Surgery** (MDS 610); 2 units/semester, 2 semesters
- **Scientific Writing Strategies, Skills and Ethics** (PS 595b) (2 units).
- **Biostatistics** (EPID 576a). Other syllabi may be considered by the Program Committee for approval.

- **Seminar**, 1 credit/semester, 2 semesters. Credit for attending relevant departmental seminars can be obtained in any specialty participating in the Medical Sciences Program. A minimum of 2 units of credit derived from departmental seminar programs is required. The dissertation defense can be presented in one of these seminar series with permission of the seminar coordinators.

- **Research** (MDS 900) (8 Units)
- **Thesis** (MDS 910) (3 Units)
- **Transfer Course** (5 Units)

(* This curriculum is tailored for DOS. Other departments need to design curricula tailored for their residents)

**Financial Support**

In order to allow sufficient time to identify a mentor, prepare a research proposal and submit the proposal for funding from outside sources (grants, fellowships, etc), interested residents should declare their interest in MDS to their Residency Directors and the Director of Graduate Studies early in their residency training. (An early declaration will also improve the likelihood that accommodations can be made for the student to rotate out and back into their residency program to complete the MDS requirements.)

Each clinical department is expected to financially support their residents who enter the MDS Program. Residents in the Department of Surgery who have been accepted into the MDS Graduate Program will be
supported with a stipend equivalent to a PGY 4 along with registration fees, medical and dental coverage. The DOS MDS MS students will receive stipend support for one year.

The resources (funding, laboratory, clinic, etc.) required to complete the Thesis Research project will be supplied by the faculty mentor.

**Time Line:** Exams and requirements for completion of the MS degree program

**PRIOR TO BEGINNING MDS GRADUATE PROGRAM TO PURSUE A MASTER’S DEGREE**

1.) **Express Interest.** Express your interest in graduate studies with the Residency Director, MDS Program Director and/or MDS Director of Graduate Studies.

2.) **Meet with the Director of Graduate Studies** to discuss the application process and receive guidance on selecting a mentor and research project.

3.) **Select Mentor.** Interview and select a specific faculty member to serve as mentor (See ‘Selection of Mentor’ below).

4.) **Prepare Research Proposal.** In concert with potential mentor, prepare a brief proposal (3 pages) describing your thesis research. You are encouraged to submit a comprehensive research proposal for outside funding prior to beginning your graduate work. (Note: those students who are successful at securing outside funding for their project will be rewarded with additional travel to either the ACS or combined SUS-AAC Meetings)

5.) **Apply to the Graduate College** (online) for admission into MDS. Submit research proposal and letter of support from mentor to the MDS Director of Graduate Studies.

6.) **After notification acceptance, work with the MDS Program Coordinator to prepare and submit a Proposed Program of Study** to the Director of Graduate Studies. You, your mentor and the Director of Graduate Studies should prepare this plan together. This form can and should be revised as changes occur throughout your graduate studies.

7.) **Register for classes**

8.) **Form a Thesis Committee.** By late August, each M.S. student will select a formal Masters Thesis Committee consisting of the major advisor/research project director and two other faculty members during the student's first semester in the program. The mentor should meet with the student on a regular basis. The other two M.S. Thesis Committee members should meet with the student once per semester to evaluate student progress and advise the student on appropriate options and actions for completing the Thesis requirements. For example, a suggested Thesis Committee meeting schedule would be: 1.) Early September to review and accept final proposal, 2.) Late December to review progress and 3.) Mid-March to review progress and finalize Defense. The Thesis Defense should occur before the end of the Spring Semester (see Grad College Website and Program Coordinator for exact deadlines) and consist of: 1.) A submission-ready, first author manuscript sent to the Thesis Committee two weeks prior to the Defense, 2.) A publically announced oral presentation of the Thesis research (typically in the form of a one-hour seminar giving at a sectional or departmental seminar) and 3.) A follow-up meeting with the Thesis Committee and the student to discuss the Thesis work. Coordination of the seminar and follow-up meeting should occur among the student, the Program Coordinator and the Mentor.

Additional information is available on the Graduate College Website at:
DOCTORAL PROGRAM

General

At the University of Arizona, the Graduate College determines the overall goals and guidelines for the doctoral program. Following these guidelines, the Medical Sciences Program establishes specific requirements and monitors student progress. The overall aims are to ensure:

- sufficient breadth of knowledge in Medical Sciences
- sufficient depth of knowledge in the student’s area of specialty
- sufficient depth of knowledge in the student’s Minor Area
- rigorous research training
- training in career skills (writing, speaking, critical evaluation of the literature)
- training in teaching skills

In addition, the guidelines and requirements that are described in this handbook have been established to ensure the protection of student interests and successful completion of the doctoral degree in a timely manner. The student is expected to comply with the regulations of the Graduate College with respect to residence, credit hour requirements, and the qualifying and comprehensive examinations (please refer to the Graduate Catalog). A high level of performance is expected of students who are enrolled in graduate programs at The University of Arizona. Students must maintain a grade point average of 3.00 (letter grade of B) or better to receive financial support and to be awarded a Ph.D. degree.

Required Coursework

The Graduate College mandates that 36 hours of coursework, exclusive of the dissertation, half of which must be graded, be completed in the major subject area by all doctoral students. This refers to courses in which regular grades (A,B,C) can be earned, and that are numbered at the 500 level or above. Eighteen (18) Dissertation Units and 9 units in a Minor Area of Study (e.g. Physiological Sciences, Immunobiology, Cancer Biology, etc.) are also required.

The courses listed below are tailored for DOS residents. Other UACOM clinical departments are expected to tailor a curriculum for their students. In some cases, certain Program requirements may be waived if equivalent coursework has been completed previously. Substitute coursework will also be considered for more advanced MDS students (e.g., Fellows or Faculty). If a waiver is desired, the student must submit a written petition to the Medical Sciences Program Committee, which will either grant or deny the waiver. Individual faculty members are not authorized to waive any of the Program requirements without prior approval of the Program Committee. Transfer credit from other institutions can be applied to an advanced degree if "approved by the Director of Graduate Studies, the grade earned is "B" or above, and it was awarded graduate credit at the institution where the work was completed." (For additional information see the UA Graduate Catalog, http://catalog.arizona.edu/2006-07/policies/acceptcr.htm.). If waivers are granted for coursework taken at other institutions, these courses are referred to as "Transfer Coursework" by the Graduate College, and must be listed as such on the Doctoral Plan of Study form http://grad.arizona.edu/Current_Students/Forms/GC_Forms.php. This form must be filed during the first academic year in the MDS Program.

The required courses for a resident in Surgery are:

Principles of Surgery (MDS 610a, 610b); 2 units/semester, 2 semesters

Scientific Writing Strategies, Skills and Ethics (PS 595b); 2 units.

Biostatistics (EPID 576a). Other syllabi may be considered by the Program Committee for approval.
**Departmental seminar programs**, 1 credit/semester, 2 semesters. Credit for attending relevant departmental seminars can be obtained in any specialty participating in the Medical Sciences Program. A minimum of 2 units of credit derived from departmental seminar programs is required. The dissertation defense can be presented in one of these seminar series with permission of the seminar coordinators.

**Minor Requirement**

The Graduate College requires all Ph.D. students to complete a "Minor Program of Study". Requirements and successful completion of a minor field of study is determined by the department in which the minor is obtained. A typical program of study is three courses or 9 graduate units. Contact the Faculty Advisor in the graduate program of interest to develop a mutually agreeable Minor Program of Study.
Complete the Minor Program of Study Form and submit it with required signatures to the MDS Program Coordinator. (Examples of Minor Areas are: Physiological Sciences, Cancer Biology, Immunology, etc.).

**Program Time Line:** Following is the general time frame in which most students progress through the Ph.D. Program in Medical Sciences.

**PRIOR TO BEGINNING Ph.D. GRADUATE PROGRAM**

1.) **Early Expression of Interest.** Early in your residency, express your interest in graduate studies with the Director of the Residency Program, the MDS Program Director and/or Director of Graduate Studies.

2.) **Meet with the Director of Graduate Studies.**

3.) **Select Mentor.** Interview and select a specific faculty member to serve as mentor.

4.) **Prepare Dissertation Research Proposal.** In concert with potential mentor, prepare a brief proposal (3 pages) describing your dissertation research. You are encouraged to submit a comprehensive version of the research proposal for outside funding prior to beginning your graduate work. (Note: those students who are successful at securing outside funding for their project will be rewarded with additional travel to either the ACS or combined SUS-AAC Meetings)

5.) **Apply** to the Graduate College (online) for admission into the MDS Ph.D. Program. Submit research proposal and letter of support from mentor to the MDS Director of Graduate Studies.

6.) After acceptance, meet with the MDS program Coordinator to prepare and submit a **Proposed Program of Study** to the Director of Graduate Studies. Include your mentor and the Director of Graduate Studies in the preparation of this plan. This form can and should be revised as changes occur throughout your graduate studies.

7.) **Register for classes**

**YEAR 1**

1.) **Complete required coursework**

2.) **Select Comprehensive Exam Committee.** You must submit the **Comprehensive Examination Committee Form** (see Program Coordinator) to the MDS Program Office prior to scheduling your written comprehensive exam.

3.) Complete the **Written** Component of the **Comprehensive Examination.** Additional information on the comprehensive exam is available at:

   [http://grad.arizona.edu/current-students/program-requirements/doctor-of-philosophy/comprehensive-examination](http://grad.arizona.edu/current-students/program-requirements/doctor-of-philosophy/comprehensive-examination)

4.) **Complete the Oral Component of the Comprehensive Exam.** Complete the form **"Application for Comprehensive Oral Examination"**. Submit the original and three copies to the Graduate College Degree Certification Office, Administration Bldg, Room 316, **AT LEAST** 1 week prior to the Oral exam date. This form requires the signatures of all your committee members as well as the Major/Minor Department Heads.
5.) Select Dissertation Committee. The composition of this committee need not be the same as the Comprehensive Exam Committee. Submit the “Dissertation Proposal Approval Form” (Appendix _) to the MDS Program Office.

6.) Prepare and submit a Comprehensive Dissertation Research Proposal for review and acceptance by your Dissertation Committee.

The various required Graduate College forms are available at: http://grad.arizona.edu/current-students/forms

YEAR 2
Perform Dissertation Research

YEAR 3
Perform Dissertation Research

PENULTIMATE SEMESTER

During the first week of this semester (Fall of Year 3), you must submit the original plus three copies of the "Doctoral Application to Candidacy" to the Graduate College Degree Certification office.

FINAL SEMESTER (Spring of Year 3)


This manual contains the directions for formatting your dissertation; however, the overall organization of the dissertation should be determined by you and your mentor. It is the responsibility of your Mentor to proof your dissertation.

The original plus three copies of the "Announcement of Final Examination" must be distributed to Degree Certification at least three weeks before the date of your final exam.

Penultimate copies of your completed dissertation manuscript must be distributed to your committee members three weeks before your final exam.

After passing your Final Oral Exam (one hour public seminar, two hours Q&A with Committee) submit two final copies of your dissertation manuscript to Degree Certification at least three weeks before your graduation date.

Questions regarding submitting forms, Graduate Representatives, and/or deadlines should be directed to the MDS Program Coordinator.

****
Note that students are required to schedule at least one meeting per year with the dissertation committee during years 2 and 3. More frequent meetings are recommended. The Program Committee will evaluate student progress each year using input from both the student and mentor.
The Qualifying Examination

Admission to the MDS Graduate Program requires successful completion of a four year medical school curriculum plus two to three years of residency training. The Qualifying Exam for MDS is successful completion of medical school and two or three years of residency.

Selection of Mentor

The choice of a mentor may be the single most important decision during graduate training. Each student must select a mentor from the MDS faculty with regular member status prior to admission into the MDS Program. A mentor is a faculty member who will serve as an advisor, supporter, tutor, master, sponsor and role model. A mentor is expected to interact with the student on a regular basis providing guidance, advice, and the intellectual challenge necessary for the student to complete the degree program. The mentor is expected to supply the resources (e.g., financial, facilities, etc) necessary to successfully conduct the research project.

The following suggestions may be of assistance to graduate students in choosing a mentor. There are two broad areas that come into play when choosing a mentor. The first area has a professional basis and the second a personal basis. When considering the professional aspects of your selection of a mentor, the following questions may prove helpful: (1) What is this individual's reputation OUTSIDE the University. Remember, when you have completed your dissertation and you are looking for a position, your mentor's reputation will initially be your reputation. (2) Does your prospective mentor have the funding and other resources available to support your research for at least three years? This issue is probably the most problematic for graduate students. The money needed to fund your research project will most likely come from your mentor's laboratory. (3) How does your prospective mentor's laboratory or clinical research program operate? You should critically evaluate the day-to-day operations of the lab or clinical research setting and understand the goals of the program and exactly where you will "fit in". You should also understand the role of your mentor in those operations. Some principal investigators have lab managers or research assistants or research nurses who run their program. You should know almost as much about these individuals as about your prospective mentor. (4) What are the professional requirements of the prospective mentor on such issues as work habits, ethics, sharing of ideas, research group meetings, journal clubs, and authorship on papers.

On the personal side, the answers to the following questions may be extremely helpful: (1) Is the personality of my prospective mentor compatible with my own? (2) Is this individual going to be responsive to my needs and, just as important, am I going to be responsive to his or her needs? When you join a research group, laboratory or clinical, your mentor will have certain expectations of you and these should be identified when evaluating a prospective mentor. By the same token, what are your expectations of a mentor? (3) What do other students and faculty think about your prospective mentor? The collegial relationship of your prospective mentor with others will influence your interaction with other laboratories and clinical research groups.

Do not forget the importance of the choice of a mentor and do not make that choice without a great deal of thought. Talk to other people about your prospective mentor and ask probing, but not inflammatory, questions. And provide yourself with HONEST answers to the professional, resources and personal aspects of your decision.

Selection of Comprehensive (and Dissertation) Committees

(Selection of Comprehensive Exam and the Dissertation Committees are not required to be the same individuals.)
The student, in consultation with the mentor, should select the Comprehensive Examination Committee. The Comprehensive Examination committee is composed of five faculty members, three with expertise in the major area of study, and two representing the minor area. At least two members of the committee must be faculty members of the MDS Program, and one from the faculty of the minor department or program. (Note that some MDS faculty members are in multiple graduate programs, and therefore can serve multiple roles on your committee.) Students must submit the signed “Comprehensive Examination Committee Form” (see MDS Program Coordinator for forms) to the MDS Program Office prior to scheduling the written comprehensive exam.

Outstanding scholars from within or outside the University whose participation on the Comprehensive (and Dissertation) committee(s) will strengthen the academic quality of the student's program, and who are not faculty in Medical Sciences, may be appointed, by exception, with the approval of the Graduate College. A request for "special committee member" can be made by the Program. This person is then a voting member of the student's committee. For tenure-track faculty in other programs, there is no special approval needed. For non-tenure track faculty, or for faculty from other universities, a “Request to Approve a Special Committee Member” form (available from the Program Office) and a Curriculum Vitae are required.

**External Reviewer.** Occasionally an external reviewer may participate on the dissertation committee. Most often this person is from outside the University of Arizona. It is expected that the mentor cover any and all costs incurred in the participation by the External Reviewer. This external reviewer is not a voting member of the student's committee (unless the student petitions the graduate college for an exception as noted above).

**The Student is strongly encouraged to meet with the dissertation committee twice a year, but is required to meet at least once per year to allow an evaluation of progress and to receive feedback.**

**Comprehensive Examination**

1. **Overview of the Comprehensive Examination and the Dissertation Proposal**

The Comprehensive Examination consists of written and oral components as required by the Graduate College of the University of Arizona. As discussed in detail below, Ph.D. students in Medical Sciences will ordinarily complete the written and oral components of the Comprehensive Examination at the end of the 2nd semester in the Program. A separate requirement of the Medical Sciences Program, the Dissertation Proposal, will be completed soon after passing the Comprehensive Exam.

2. **Objectives of the Comprehensive Examination**

The objectives of the Comprehensive Examination are:

a) to determine if the student has attained adequate breadth of knowledge in medical sciences, An adequate breadth of knowledge reflects to the material covered in the required courses, as well as in the courses that satisfy the minor degree

b) to determine whether the student has attained a sufficient depth of knowledge in selected sub-disciplines of medical sciences, including knowledge of the literature, concepts and experimental approaches in the area of specialization

c) to assess the student's ability to think clearly and independently about topics in the Medical Sciences and to express these thoughts orally and in writing
3. Timing of the Comprehensive Examination

The Comprehensive Examination will ordinarily take place soon after completing the required coursework (i.e., May-June of Year I). In exceptional circumstances, such as illness or a family crisis, students may petition the Program Committee for extension of the deadline.

4. The Comprehensive Examination Committee

During the 1st year in the program, students will select a Comprehensive Examination Committee. As described above, this committee will consist of 5 members (including the advisor), selected to reflect the student's minor and area of interest in Physiological Sciences, as well as the anticipated make-up of the Comprehensive Examination (see below). A member of the committee other than the major advisor will serve as chair. This committee may or may not be identical to the student's Dissertation Committee. The Program will provide each member of the Committee with the “Comprehensive Examination Guidelines” which outlines the goals and format of the Comprehensive Examination. The Program will provide the committee chair with the “Comprehensive Exam Committee Chair Checklist.” The student will arrange a meeting of the members of the Comprehensive Examination Committee at least 6 weeks prior to the anticipated date of the Written Comprehensive Examination. At this meeting the general research interests and background of the student will be discussed. The student and committee will discuss a time-table for the Comprehensive Examination. The Committee will inform the student of its general expectations and help the student to prepare for the Examination by suggesting review articles or other readings.

5. The Written Comprehensive Examination

The examination must evaluate the student’s breadth of knowledge in Medical Sciences, but should also reflect the specialized interests that each student has developed by this stage. To ensure that all levels of understanding in the Medical Sciences curriculum are addressed, the exam topics are: a.) Principles of Surgery (Didactics), b.) Biostatistics, c.) Minor Area of Expertise and d.) Dissertation Topic. There is no substitute for helpful communication between the student and Comprehensive Examination Committee members as the questions are being planned and the student prepares for this exam.

The Written Comprehensive Examination will be in a take-home, essay format. The members of the student’s Comprehensive Examination Committee will discuss the areas to be covered by the exam and each of the five members will write one question and submit their question to the chair. The chair will insure that the written questions are reasonable and challenging, covering the four topic areas above. The Dissertation Topic question need not focus specifically on the student’s prospective dissertation topic, but may include related areas that form the essential background for it. The student will be presented with the written exam and will choose 4/5 questions to answer over a two-week period using information from textbooks, journals and class notes.

The answer to each question should be no more than 10 single-spaced pages using 12 point font (including graphs and figures but not including citations). Students are expected to use textbooks, journal articles, class notes and similar sources of information to prepare essays in answer to the questions. The essays should include graphs or other figures as necessary to illustrate answers. All direct quotes or figures drawn from other sources must include proper citations. Students may not consult other people in preparing their answers. All figures and legends must be legible. Page limits and font size requirements will be strictly enforced.

The answers will be graded by the Committee members who wrote the questions. Students will receive a grade (S/P/F) and written comments are encouraged for later discussion during the oral phase of the exam.
A passing grade (S or P) for all four answers is necessary for successful completion of the Written Examination. Failure to achieve this grade will constitute failure of the Written Comprehensive Examination. The entire Examination may be retaken once, after mentoring by Committee members (ordinarily within one month). The retake exam may focus only on the failed categories, if agreed upon by the entire committee. Failure in the second attempt will constitute failure of the Written Comprehensive Examination. Failure of the Comprehensive Examination will result in dismissal from the MDS Program.

After the written portion of the comprehensive Examination has been completed successfully, the student may file an "Application for Comprehensive Oral Examination for Doctoral Candidacy” form with the Graduate College. This form represents and instructions for its completion can be found on the Graduate Degree Certification Website at: http://grad.arizona.edu/current-students/forms

This form (the original plus three copies) must be submitted prior to the date of the Oral Comprehensive Examination. Before you submit this form the student must:  

a) Schedule your oral examination with the members of your committee;  
b) Provide your committee with an updated Study Program, including all of the courses that will be used to fulfill your degree requirements; and  
c) Obtain signatures from all of the Comprehensive committee members. Students must be registered during the semester the written and oral examinations are taken, and these examinations must take place within six months of one another.

6. The Oral Comprehensive Examination

The Graduate College describes the oral comprehensive exam as follows:

“Upon successful completion of the written examinations in the major and minor(s), the Oral Comprehensive Examination is conducted before the examining committee of the faculty. This is the occasion when faculty committee members have both the opportunity and obligation to require the student to display a broad knowledge of the chosen field of study and sufficient depth of understanding in areas of specialization. Although a discussion of proposed dissertation research may be of importance, such a discussion can not be used to satisfy the requirements of the Oral Comprehensive Examination. The examining committee must attest that the student has demonstrated the professional level of knowledge expected of a junior academic colleague.”

Students should be aware that during the oral examination committee members often pursue answers from the written examination in more depth or ask the question that the student chose not to answer in the written exam.

Upon successful completion of the Written Comprehensive Examination, the student and committee may schedule the oral portion. The Oral Comprehensive Examination must be completed relatively soon after the written portion. The oral exam will last between 2 and 3 hours. The student should be prepared to answer questions not only related to topics previously discussed with the committee, but also related to material covered in the required core courses. Students have found that an excellent way to prepare for the oral exam is to hold mock oral exams. The students’ mentor can organize these mock exams and other students can serve as questioners. The questions will not be the same as the student will get in the oral, but will help the student prepare for thinking on his or her feet. Students may not bring notes into the oral examination but, at the committee’s discretion, may be permitted to make a brief presentation relevant to the dissertation research topic. However, the oral exam will not focus on the dissertation research. The Examination will consist 50-70 % of questions in Medical Sciences with emphasis on the student's area of specialization, and 30-50 % of questions in the minor (which may overlap). Students may be permitted to retake the Oral Comprehensive Examination once they fail in the first attempt. The Graduate College stipulates a four month waiting period for a retake.

(There is no longer a Graduate College Representative for this exam. The student’s committee chair (not the mentor) now serves as the graduate college reporter and representative for the written and oral exams.)
The Dissertation Committee

Students must select a Dissertation Committee during the second semester of the first year in the graduate program. The Dissertation Committee must meet with the student at least once each year, with a member other than the major advisor (mentor) serving as chair. There is no obligation for the student to convene the same faculty members on their Comprehensive Examination and Dissertation Committees.

The Dissertation Proposal

As described above, a brief research proposal was submitted as part of the application process. An updated and more comprehensive proposal should also be presented to the Dissertation Committee once it is formed. A proposal that provides a compelling rationale and research plan for the dissertation topic. The Dissertation Proposal is not part of the Comprehensive Examination, but is a key requirement of the Medical Sciences training program providing a valuable opportunity for students to develop grant-writing skills and to receive feedback from their committees at a relatively early stage of the experiments. The goal is to develop a rigorous and feasible experimental plan that will serve as a guide for the dissertation research, although the experiments may be modified if necessary as the work proceeds. The student is strongly encouraged to submit this more comprehensive version of the proposal in competition for outside funding.

The completed draft of the proposal should be provided to the Dissertation Committee members for comment and a meeting of the student and the committee should take place at which the student will field questions about the rationale, design, and interpretation of the proposed experiments. Once the Dissertation Proposal has been revised to the satisfaction of all members of the Dissertation Committee, the members of this committee will sign the “Dissertation Proposal Approval” form (Appendix _). A copy of this form is then submitted to the MDS Program Office.

Advancement to Candidacy

After successful completion of the comprehensive written and oral examinations, you are automatically advanced to candidacy. The Graduate College requires you to submit the “Committee Appointment Form” for your Dissertation Committee six months prior to scheduling your final Defense (This form replaces the old “Advancement to Candidacy Form”). Along with the Committee Appointment form, you must submit a copy of the Human/Animal Subjects Committee Review if your dissertation project was subject to such a review. For human subjects, your name must be listed on the protocol.

Penultimate Draft of Dissertation

Submit copies of the draft of your dissertation document to your committee. Make sure you allow adequate time for your committee to review and for you to prepare the final version. For information regarding the preparation of the dissertation, see the booklet entitled "Manual for Theses and Dissertations," which is available at http://grad.arizona.edu/documents/PDF/ETD_Diss_Manual.pdf

Announcement of Final Examination

The final examination is your dissertation defense. The Announcement of final examination form (original plus three copies) is submitted at least three weeks prior to the date of your examination. The form must be signed by your Dissertation Committee.

Final Copies of Dissertation Document

Online submission of the dissertation is now available. The final dissertation must be submitted via the electronic submission site at http://dissertations.umi.com/arizona/ and must meet all specifications of the manual. You can order your bound copies from this site. The dissertation is submitted by about April 20
for May graduation, November 26 for December graduation and August 11 for August graduation. Check with the MDS Program Coordinator for exact dates. The last requirement is to clear all fees with the Bursar's office, failure to clear you account will postpone the posting of your degree.

**YOU MUST BE REGISTERED TO DEFEND! YOU MUST ALSO BE REGISTERED DURING THE SEMESTER YOU SUBMIT YOUR DISSERTATION!**

To defend and/or submit the final copies of the dissertation in the Fall or Spring semester you must register for a minimum of three graduate units; during the summer, you must register for one unit either summer session.

**Financial Structure of the Doctoral Program**

In order to allow sufficient time to identify a mentor, prepare a research proposal and submit the proposal for funding from outside sources (grants, fellowships, etc), interested residents should declare their interest in MDS to their Residency Directors and the Director of Graduate Studies early in their residency training. (An early declaration will also improve the likelihood that accommodations can be made for the student to rotate out and back into their residency program to complete the MDS requirements.)

Each clinical department is expected to financially support their residents who enter the MDS Program. Residents in the Department of Surgery who have been accepted into the MDS Graduate Program will be supported with a stipend equivalent to a PGY 4 along with registration fees, medical and dental coverage. The PhD students will receive stipend support for up to three years.

The resources (funding, laboratory, clinic, etc.) required to complete the Dissertation Research project will be supplied by the faculty mentor.

**Competitive Predoctoral Fellowships**

The Program encourages individual students to seek supplementary funding. The advantages of seeking predoctoral fellowships are that it provides the student with an opportunity to develop grant-writing skills, it brings prestige to you and the Program, funding enables more students to join the Program, and gives the individual more opportunity and authority to shape the scope and aims of the project.

**Scientific Conferences**

Depending upon the availability of funds, the Program attempts to defray the costs for students who are attending and presenting a “first author” poster or talk at one national meeting per year. The Program will pay for reasonable costs associated with travel, lodging, meals and registration fees.

**Teaching Activities**

The Medical Sciences Graduate Program participates in a broad selection of teaching activities. The faculty members believe that teaching, and the communication skills it develops, is a central part of graduate training. Teaching responsibilities include, but are not limited to, preparing and delivering lectures in Didactics, organizing and conducting Journal Clubs.
MEDICAL SCIENCES PROGRAM ADMINISTRATION (As of: November, 2011)

MDS Graduate Program Head: Rainer Gruessner, M.D., Department of Surgery

MDS Director of Graduate Studies: Paul McDonagh, Ph.D., Department of Surgery

MDS Program Coordinator: Diane Poskus, Department of Surgery

MDS Graduate Program Committee:

   Rainer Gruessner, M.D.
   Paul McDonagh, Ph.D.
   Randall Friese, M.D.
   Amy Waer, M.D.
   Ronald Heimark, Ph.D.
   Evan Ong, M.D.

Currently (November, 2011), all students in the MDS Program are from the Department of Surgery and thus, the program is administered solely by DOS. The Medical Sciences Program is administered by the Program Head. Assisting the Program Head are: the Director of Graduate Studies, the MDS Program Committee and the Program Coordinator.

Program Head is responsible for overall leadership and administration of the MDS Graduate Program.

Director of Graduate Studies is responsible for developing the program curriculum and course content. Serves as the liaison routine with the Graduate College. Serves as a mediator between the students and their mentors. Insures that MDS policies and procedures comply with Graduate College requirements. Actively participates in Recruiting and Admissions. Routinely advises students on matters of curriculum and research. Develops and maintains the MDS Handbook. Works closely with the Program Coordinator in the daily operations of the program.

Program Committee: Responsible for oversight of the MDS Program. Monitors curriculum and course development. Serves to recruit students and evaluate applicants. Evaluates graduate student progress and formal mediation of the concerns and grievances of graduate students. Graduate students are encouraged to consult with any member of the Program Committee to resolve any issue related to their graduate education that is of concern.

Resources Committee -- Developing and implementing the financial plan for the Program, including offering graduate students assistance in obtaining extramural pre-doctoral awards.

Faculty Membership in the Medical Sciences Graduate Program

The Committee on Medical Sciences consists of tenured (or tenure-eligible) faculty members at the University of Arizona who participate in graduate education and research in Medical Sciences. An affiliate membership is available to non-tenure-eligible faculty.

A. Regular Membership

1. Criteria
   a. Faculty (tenure-eligible only) shall be nominated for membership in the Committee on Medical Sciences by submitting a request for membership and a recent curriculum vitae to the Program Committee. a two-thirds majority of positive votes of the Program Committee shall be required for nomination to membership. Criteria for membership shall include demonstrated research activity, interest in graduate education, and resources for graduate training.
2. Responsibilities
   a. Members of the Committee on Medical Sciences may serve as academic and research advisors of graduate students in the program and as members of graduate and other committees.
   b. Members shall be expected to share in the financial support of graduate students at a level determined by the MDS Program Committee.

B. Affiliate Membership

1. Non-tenure-eligible faculty who otherwise meet the criteria for membership, may apply for affiliate membership in the Committee on Medical Sciences by submitting a request for membership and a recent curriculum vitae to the Program Committee. A two-thirds majority of positive votes of the Program Committee shall be required for election to affiliate membership.

2. Affiliate members shall have all the privileges and responsibilities of regular members except that they shall only serve as co-directors of graduate dissertation committees in conjunction with a regular member.

Prepared: November 1, 2011