

MD-MSCR (Master of Science in Clinical Research) Combined Degree Program

The MD-MSCR degree aligns with MUSC's mission as it prepares physicians to participate in biomedical clinical research and advance new knowledge. The MD-MSCR degree provides currently enrolled medical students with the opportunity to acquire core competencies in clinical research. Students completing the prescribed course of study for the MSCR degree, either in a concentrated full-time option or a blended part-time option, will complete the combined degree in 5 years.

Description of the Program

Program timing: The earliest entry into the MD-MSCR degree program is the second semester of the MD degree program. Students submit their application as early as fall of year 1 and no later than December 15th of year 4. Students in the accelerated MD degree curriculum track are not eligible to apply. Students in the Primary Care Parallel track at MUSC AnMed Health clinical campus are eligible to apply.

Application: Only students who are enrolled in good academic and professional standing in the MD degree program may apply to transfer into the combined degree program. To apply, students should email the Associate Dean of Student Affairs and Student Wellness or the Associate Dean for Student Affairs and Professionalism in the College of Medicine to explain their rationale for seeking acceptance into the combined degree program and state when they would like to enter the program; the respective associate dean will meet with the student for academic advising prior to notifying the Director of the MSCR program. Students must submit the following to the Director of the MSCR degree for review by the College of Graduate Studies Admissions Review Committee: an official medical school transcript and a letter from the COM Student Progress Committee confirming support for the student's enrollment in the combined degree program.

Acceptance and Approval of Transfer: Students are accepted/approved to transfer into the program if the following occur:

1. Confirmation from the College of Medicine Dean's Office - Student Affairs that the requested timing of entry into the combined degree program is compliant with college and university policies.
2. Review and approval from the Student Progress Committee (SPC) confirming their confidence that the student will be able to succeed professionally and academically. If a student seeks to enter the blended curriculum, the final curriculum plan must be approved by both the Director of the MSCR and the associate dean(s) for curriculum for the relevant phases of the MD degree in order for the SPC to approve transfer.
3. Approval from the Admissions Review Committee in the College of Graduate Studies.
4. Verification that the student has met with the Office of Financial Aid.

Cost: The cost for pursuing the MSCR *as part of the MD-MSCR combined degree* is a one-time MSCR fee of \$20,661 (in-state or out of state status) when the student is transferred from the MD degree program to the MD/MSCR degree program. All regular medical school tuition and fees are collected for each of the 4 years of the MD degree portion of the MD-MSCR program. The bill is triggered by student enrollment in the course MCR 970 MD Mentored Research: 0.25 credit hours.

Policies and Procedures: All students enrolled in MD-combined degree programs are fully responsible for following all of the policies of the MD degree program including but not limited to professionalism, progress, and student responsibilities, including phases in which they are enrolled solely in MSCR coursework. Students are also fully entitled and encouraged to utilize all of the resources available as an MD degree student.

Clarification: MS.MS Stop-Out Option

MD/MSCR students are eligible for the MS.MS stop-out option if they have completed the requisite preclerkship curriculum/semesters designated. MSCR coursework does not count toward the MS. MS degree.

Curriculum

The courses required for the combined degree are the sum of the courses required for the MD and MSCR degree separately. Students must complete all of the MD degree graduation requirements (see policy) in addition to the MSCR requirements in order to receive the combined degree. There is no elimination of courses from either degree with the combined degree structure with two exceptions: the Critical Review of the Literature and Ethical Issues in Clinical Research courses completed during FLEX Phase in the MD curriculum satisfy the course requirements in the MSCR degree curriculum. The courses for the MSCR degree are described in the next section.

Typical Sequencing of MSCR Curriculum for the Combined MD-MSCR Degree

The MUSC combined MD-MSCR degree allows students accepted into the program to complete both of these desired degrees without having to withdraw from the MD degree to enroll in the MSCR degree. Therefore, MSCR coursework can be completed in a concentration between year 3 and year 4, or concurrently to complement MD coursework beginning as early as the spring of year 1. The recommended course sequencing is listed below for two different options students may choose.

Option 1: Concentrated (Full-time) MSCR Sample Curriculum Plan

This curriculum plan applies to a student who completes the entire MSCR curriculum, for example, in *one dedicated year between year 3 and year 4* of the medical school curriculum (39 credit hours completed over 3 semesters).

Fall Semester

MCR 738-01 Clinical Research Introductions: 1 credit hour
MCR 700-01 Clinical Biostatistics: 3 credit hours
MCR 731-01 Critical Review of the Literature: 2 credit hours
MCR 736-01 Clinical Epidemiology: 3 credit hours
MCR 750-01 Ethical Issues in Clinical Research: 1 credit hour
MCR 789-13 ST: Contemporary Topic Seminar: 1 credit hour
MCR 970- Mentored Research: 2 credit hours
MCR 970 MD Mentored Research: 0.25 credit hours

Spring Semester

MCR 724-01 Introduction to Clinical Trials: 3 credit hours
MCR 732-01 Comparative Effectiveness Research: 3 credit hours
MCR 746-01 Informatics and Data Management for Clinical Research: 2 credit hours
MCR 752-01 Team Science in Clinical Research: 1 credit hour
MCR 789-03 ST: Regression Analysis for Clinical Research: 2 credit hours
MCR 789-20 ST: Introduction to Grant Writing for Clinical and Translational Research: 1 credit hour
MCR 970 Mentored Research: 3 credit hours

Summer Semester

MCR 789-04 ST: Community Engagement Research: 1 credit hour
MCR 789-07 ST: Industry/Regulatory: 2 credit hours
MCR 789-02 Innovation in Clinical Researcher Placement: 1 credit hour
MCR 789-08 ST: Core Clinical Research Training: 1 credit hour

MCR 789-32 ST: Leadership: 2 credit hours
MCR 970 Mentored Research: 4 credit hours

Option 2: Blended (Part time) MSCR Sample Curriculum

A student who enrolls in the combined degree program in the spring semester of year one of medical school (i.e., the earliest entry point) could be permitted to complete MSCR coursework concurrently with the MD degree curriculum (39 credit hours completed over 11 semesters). While the majority of the MSCR curriculum is still completed in year 4 and year 5 (fall, spring), this curriculum plan provides advantages for students who wish to engage in research earlier in the program in order to increase competitiveness for application to residency programs. Sample schedule below. The final curriculum schedule must be approved by the director of the MSCR and the appropriate associate dean(s) for curriculum in the MD degree program prior to approval by the COM Student Progress Committee.

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| Year 1 Spring Semester | MCR 738-01 Clinical Research Introductions: 1 credit hour MCR 724-01 Introduction to Clinical Trials: 3 credit hours MCR 970 MD Mentored Research: 0.25 credit hours |
| Year 2 Summer Semester | MCR 700-01 Clinical Biostatistics: 3 credit hours |
| Year 2 Fall Semester | MCR 736-01 Clinical Epidemiology: 3 credit hours |
| Year 2 Spring Semester | MCR 750-01 Ethical Issues in Clinical Research: 1 credit hour (MD FLEX) MCR 731-01 Critical Review of the Literature: 2 credit hours (MD FLEX) MCR 970- Mentored Research: 1 credit hour |
| Year 3 Summer Semester | MD 3rd year Clinical rotations MCR 789-08 ST: Core Clinical Research Training: 1 credit hour |
| Year 3 Fall Semester | MD 3rd year Clinical rotations MCR 789-13 ST: Contemporary Topic Seminar: 1 credit hour MCR 970- Mentored Research: 1 credit hour |
| Year 3 Spring Semester | MD 3rd year Clinical rotations MCR 970- Mentored Research: 1 credit hour |
| Year 4 Summer Semester | MD 3rd and 4th year Clinical rotations MCR 970- Mentored Research: 1 credit hours |
| Year 4 Fall Semester | MD 4th Year Clinical Rotations MCR 789-03 ST: Regression Analysis for Clinical Research: 2 credit hours MCR 752-01 Team Science in Clinical Research: 1 credit hour MCR 789-07 ST: Industry/Regulatory: 2 credit hours MCR 789-32 ST: Leadership: 2 credit hours |
| Year 4 Spring Semester | MD 4th Year Clinical Rotations MCR 732-01 Comparative Effectiveness Research: 3 credit hours MCR 789-02 Innovation in Clinical Researcher Placement: 1 credit hour MCR 970- Mentored Research: 2 credit hours |
| Year 5 Summer Semester | MD 4th Year Clinical Rotations MCR 970- Mentored Research: 1 credit hours |
| Year 5 Fall Semester | MD 4th Year Clinical Rotations MCR 789-20 ST: Intro to Grant Writing for Clin and Trans Research: 1 credit hours MCR 970- Mentored Research: 2 credit hours |
| Year 5 Spring Semester | MD 4th Year Clinical Rotations |

MSCR Courses

Courses with an **asterisk (*)** are eligible to count for the 19 required credit hours for the Certificate.

MCR 750-01 Ethical Issues in Clinical Research* - Required for the first semester of all MD-MSCR students. An emphasis will be placed on the ethical issues associated with clinical research and practice. The focus of the class will be the review of the competencies involved in the conduct of ethically responsible research. The process of assessing ethical issues in research and study will be described. The ethical considerations in study design; study implementation, data management, data analysis, data Interpretation and results presentation and publication will be described. 1 credit hour

MCR 700-01 Clinical Biostatistics* -An introduction to basic and intermediate statistical techniques used to analyze and interpret data in health sciences and related fields. Emphasis is on applications of these methods, with just enough derivation to understand the procedures. Topics include descriptive statistics, graphical methods and probability with applications to epidemiology, discrete and continuous distributions, inference on means, nonparametric methods, and inference on proportions, contingency tables, correlation, analysis of variance, linear regression, logistic regression, and survival analysis. Students will not be expected to run computer programs but will learn how to read printout in order to interpret analytical results. 3 credit hours

MCR 731-01 Critical Review of the Literature*- It is assumed that students in this class have a solid foundation in research design and both parametric and nonparametric statistics. An emphasis will be placed on the competencies and processes necessary to review the scientific literature. In particular, the students will review the published and unpublished literature associated with clinical research results. The focus of the class will be the review of the types of scientific and clinical research manuscripts papers and reports produced from different study approaches. 2 credit hours

MCR 736-01 Clinical Epidemiology* - This course provides an introduction to the discipline of epidemiology and its application to public health research and practice. The course is designed to provide a conceptual foundation for epidemiologic research and application, especially study designs, quantitative concepts and methods, analysis, and interpretation. 3 credit hours

MCR 724-01 Introduction to Clinical Trials* - An emphasis will be placed on the concepts, study designs and procedures used in the implementation of clinical trials research studies. The methodology and process used to access and analyze data as well as the collection of data will be described. 3 credit hours

MCR 732-01 Comparative Effectiveness Research* - This course explores the scope of outcomes studies for evaluating the effectiveness of medical care by emphasizing the development of study designs matched to the research question. The course explores frequently used observation study designs, techniques for evaluating and selecting health outcomes measures, and analytical approaches appropriate to conducting health outcomes research. This course will also cover the approaches used for interpretation and translation of CER data through decision models to compare the cost effectiveness of treatments. 3 credit hours

MCR 789-07 Special Topics (S): Industry/Regulatory* -The course focuses on the conduct of clinical research, whether an investigator-initiated study or participation as a site in an industry sponsored clinical trial. It will present in detail all aspects of clinical research including assessment of opportunities and feasibility, building a budget, negotiating contracts, managing regulatory requirements, and understanding intellectual property. 2 credit hours

MCR 752-01 Team Science in Clinical Research* - An emphasis will be placed on the competencies and processes associated with the concepts of team science in translational research necessary to review the scientific literature. Solving complex societal problems (e.g., environment, poverty, cancer, healthcare) requires the integration of specialized knowledge bases. 1 credit hour

MCR 789-20: Introduction to Grant Writing for Clinical and Translational Research* - The course will function as an interactive description of the research grant mechanisms, application process, review process and implementation. The different types of grants will be presented and the details of the application and peer review. The source of funding will be described. Students will learn an overview of the types of grants, potential funding sources, how to get started and resources available at MUSC. 1 credit hour

MCR 738-01 Clinical Research Introductions - This course provides students with the basic structure of clinical research, mentorship, resources for professional research available throughout the campus. Emphasis will be placed on a variety of clinical research conducted on MUSC's campus. 1 credit hour

MCR 746-01 Informatics and Data Management for Clinical Research* - This course is intended to introduce clinical researchers to research oriented data management and related basic topics in Informatics. Students taking this course will learn about basic concepts in relational database design, modern research data capture tools, clinical data warehousing, security risks and mitigations, privacy issues in electronic data, data standards, data mining and other related topics. Students will get hands-on experience with using modern database tools to solve specific scientific problems by attending the course labs. 2 credit hours

MCR 789-03 ST: Regression Analysis for Clinical Research* - Regression analysis is at the heart of statistics, and a sound knowledge of regression methods will serve students well as they design and conduct research projects. We begin with simple linear regression and then consider extensions such as multiple predictors, nonlinear effects, categorical predictors, and interactions. Students will learn to evaluate model fit using statistics such as t, F, and R² in addition to informal analysis based on observable data patterns. We will rely heavily on graphical representations of the data and make use of plots of regression residuals. Concepts and techniques of regression analysis will be taught based on carefully developed examples. This course is intended for anyone involved in analyzing data, but who does not specialize in statistics. We will use computer software (mainly SAS) to examine data output, but students will only be required to read and understand the output. Students are not responsible for computer programming. 2 credit hours

MCR 789-04 ST: Community Engagement Research*- This course provides a foundation for incorporating the principles and methods of CE in the development of community-academic research partnerships and implementing best practices of CEnR. Topics include social determinants of health, ethics and responsible conduct in CEnR, and strategies to engage communities across phases of the research process. 1 credit hour

MCR 789-32 ST: Leadership* - This course introduces the major historical and contemporary theories of leadership in the workplace with emphasis on the principles and application of leadership skills. The course will include the study of organization structures, principles, techniques and processes as they relate to practice in and management of health services and research organizations. Students should gain a better understanding of organizational behavior issues such as motivation, leadership, communication, interpersonal conflict, group dynamics, organizational structures, and meeting procedures. 2 credit hours

MCR 789-08 ST: Core Clinical Research Training - This course prepares participants to coordinate cost-effective health care research which protects the rights and safety of human subjects, achieves recruitment and retention outcomes and contributes to the science of health care. Participants completing the training will be prepared to coordinate research studies in compliance with the Good Clinical Practice Guidelines and federal regulations concerning human subject research. All participants of this course are required to take the CITI MIAMI Good Clinical Practice as a co-requisite. 1 credit hour

MCR 789-02 Innovation in Clinical Researcher Placement - Innovation has become an important component of academic and scholarly activities and, as such, achievements in innovation should be recognized as essential part of the academic clinical research role, as well as a consideration for promotion and tenure for the academician in clinical research. Metrics and recognition in research, education, clinical services all covered in the course. 1 credit hour

MCR 789-13 ST: Contemporary Topics Seminar - The seminar was created to meet the thematic area of the core competencies in cross disciplinary training for student awareness of current issues in medical education and to focus on contemporary research study designs and techniques for application in patient populations. 1 credit hour

MCR 970 Research - This is a varied credit hour research course determined by the student and mentor. A contract between the two includes material covered and deliverables at the end of the semester. Variable, 1 – 10 credit hours

The MSCR degree program, the MD degree program, and the combined MD-MSCR degree program are all approved by the South Carolina Commission on Higher Education.

MD-MSCR Degree CIP Code: 51.1201

1. College of Medicine Undergraduate Curriculum Committee: January 12, 2018
2. College of Graduate Studies Curriculum Committee: January 16, 2018
3. MUSC Education Advisory Council: August 22, 2019
4. MUSC Provost's Council: September 16, 2019
5. BOT approval: October 10, 2019
6. CHE approval: December 16, 2019

MD/MSCR Combined Degree Enrollment Requirements and Academic Charges

Concentrated (Full-time) MSCR dedicated year:

- The student is changed from MD.MD to MD.MSCR status by enrollment management.
- A \$20,661 fee is charged when the student is enrolled in the MCR 970 MD course (0.25 cr)
- No MD tuition is paid during this year, but the student pays the Disability Insurance Fee (COM); plus Wellness Fee (UNIV) and Health Insurance Fees (UNIV)

Blended (Part-time) MSCR option:

- The student is changed from MD.MD to MD.MSCR.
- A \$20,661 fee is charged when the student is enrolled in the MCR 970 MD course (0.25 cr)
- The student continues to pay MD tuition for each of the 4 years of the MD degree and pays all COM fees plus Wellness Fee and Health Insurance Fees (UNIV)
- In the 5th year a waiver for all of the MD tuition and fees is submitted by COM.

Refund: If a student elects to stop pursuing the combined degree **in the same academic year** in which they started the program, a full refund of the MSCR fee will be made if the student is enrolled in the MSCR part-time and is concurrently enrolled in MD courses. If the student withdraws while enrolled in the MSCR full-time (i.e., not enrolled in MD courses), and after the university window of time for refunds, the Administrative and Services cost incurred by the College of Medicine (roughly \$7700) will be deducted from the refund. If the student transitions out of the combined degree after the academic year in which they enrolled in it, the fee will not be refunded, though the student has the opportunity to earn a Certificate in Clinical Research (an approved Certificate by the CHE) upon completing the required MSCR courses.

Clarification: MS.MS Stop-Out Option

MD/MSCR students are eligible for the MS.MS stop-out degree option if they have completed the requisite preclerkship curriculum/semesters designated.

Financial Aid Advising Based on AY20-21 Financial Aid Data

Any student choosing to enter **Concentrated (Full-time) MSCR Curriculum Plan** needs to be advised:

- Students in a dedicated MSCR year have lower annual and lifetime limits for federal unsubsidized loans.
- Federal unsubsidized loans do not require a credit check. Grad Plus loans are also available but they DO require a credit check.
- Borrowing the additional \$20,661 MUST occur in the term in which it is charged. Retroactive adjustments in a subsequent term cannot be made. Students must consider carefully whether they need to borrow this fee amount because they cannot request it later.
- Students must consider whether that maximum amount is enough to permit them to participate based on their individual finances and how much they may have borrowed to this point. A student's personal borrowing history may place them near or at that higher limit and the added \$20,661 might cause them to reach the limit sooner. **Students should reach out to the MUSC Financial Aid Office for advising about finances.**
- Annual Limits are dependent on the term in which the dedicated year starts:
 - College of Medicine aid years begin with Summer term:
 - **Students in all-MD or blended MD.MSCR** curriculum have an annual unsubsidized loan limit of \$47,167 per year, divided evenly between our three terms.
 - Students in an **MSCR-only curriculum** have a \$20,500 annual unsubsidized loan limit.
 - If a student enters the dedicated year in the Summer, they may borrow only \$20,500 in unsubsidized loans and then have the option to apply for a credit-checked Grad Plus loan for any additional living expenses if they choose.
 - If a student starts a dedicated year in the Fall, they will have already **nearly exhausted their new lowered annual limit of unsubsidized loans** during their Summer in the MD curriculum. Which means practically ALL of the loans for Fall and Spring will need to be credit-checked Grad Plus loans. In addition, Financial Aid will need to cancel and re-originate the Fall + Spring loans they were already approved for before knowing they were going into the dedicated year.
 - A student with a poor credit score may require a cosigner to secure loans.
- Lifetime limits are dependent on what year in curriculum the dedicated year is taken:
 - **Students in all-MD or blended MD.MSCR** curriculum have lifetime unsubsidized loan limits of ~\$224k.
 - If a student switches to an **exclusively non-health-professional curriculum** for a term, even if part of a combined program that results in two degrees, their lifetime limit during that non-HP (i.e., dedicated MSCR) period instantly drops to ~\$138k. Regulations are clear and spell out exactly this scenario.
 - Therefore if a medicine student who has already taken out >\$138K in unsubsidized loans, switches to the MD.MSCR program, and starts a dedicated MSCR year, regardless of which term that year starts, they are likely to be ineligible for additional unsubsidized loans and will need to apply for credit-checked Grad Plus loans. A student with poor credit and no cosigner may have difficulty paying for a dedicated MSCR year if they have previously taken out >\$138K unsubsidized loans while in the MD program.

