ARISE MD

OVERVIEW

The Advance Research training In Science for MDs (ARISE-MD) PhD at UAB is a physician scientist training pathway designed to prepare residents and fellows at UAB for the roles of researchers, scholars and leaders capable of making a substantive contribution to academic medicine. The ARISE-MD pathway is designed to build on previous training at the undergraduate medical education level obtained from a nationally accredited school of medicine. The multi-year program offers future clinician-scientists a pathway that combines clinical training with advanced research training in multiple arenas of basic science leading to a PhD degree from one of eight Graduate Biomedical Science (GBS) PhD themes. It is through immersion in a research project that ARISE-MD students gain the knowledge and skills required for the successful completion of a dissertation. Residents or fellows from any graduate medical education (GME) training program at UAB can apply to the ARISE-MD.

PROGRAM OUTCOMES

- Synthesize historical and philosophical knowledge as a foundation for the design and conduct of research that generates new knowledge
- Critically appraise and synthesize evolving knowledge as a foundation for a scientific program of research
- Generate knowledge that informs the design, implementation, and evaluation of interventions that contribute to the advancement of science and facilitate optimal patient, population, and health systems outcomes
- Conduct investigations based upon scientifically sound conceptual and methodological decisions about research designs, measures, and analytic methods
- Demonstrate scientific integrity in the design, conduct, and dissemination of research
- Participate in the mentoring of the next generation of physician scientists

ARISE-MD MINIMUM ADMISSION REQUIREMENTS

- A Doctor of Medicine (MD) from a nationally accredited institution, equivalent to that in the UAB School of Medicine
- Eligibility for licensure as a physician in Alabama
- Active resident or fellow matched at UAB through the UASOM Graduate Medical Education Office (ERAS Application and Match Acceptance)
- A personal statement that evidences prior research experiences, congruence between the applicant’s research interests and chosen mentor’s research, and future endeavors as a physician scientist in academic medicine
- A current CV or NIH Biosketch
- Two references from individuals with expertise to comment on the applicant’s capability for research and scholarship (e.g., research mentor and UAB Residency or Fellow Chair)
- A personal interview with an ARISE-MD advisory member or designee

Biochemistry & Structural Biology (BSB) Theme - MSTP/ARISE

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Module Courses</td>
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<tr>
<td>GBSC 742</td>
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<td>GRD 717</td>
<td>Principles of Scientific Integrity</td>
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<td>Biostatistics 5</td>
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<td>Translational Research Seminar 7</td>
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1 Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBSC 718, GBSC 727, GBSC 729, GBSC 744, GBSC 747

2 Required each fall and spring semester

3 Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course

4 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course

5 Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBS 700, GBS 713, GBS 720, INFO 673, INFO 793

6 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 705, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.

7 Required every semester

8 Required each fall and spring semester

9 Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Cancer Biology (CANB) Theme - MSTP/ARISE

<table>
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<td>GBS 774</td>
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**Cell, Molecular & Developmental Biology (CMDB) Theme - MSTP/ARISE**

**Requirements**  

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<td>Journal Clubs</td>
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<tr>
<td>Three Advanced Courses</td>
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<td>MSTP/ARISE Required Courses</td>
<td>39</td>
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<td>MSTP 794 Translational Research Seminar</td>
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<td>MSTP 795 Continuing Clinical Education</td>
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<tr>
<td>Research</td>
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<td>Total Hours</td>
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1. Required each fall and spring semester.
2. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBS 726, GBD 727, GBS 728, GBS 729, GBS 739, GBD 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBS 793, GBS 700, GBS 713, GBS 720, INFO 673, INFO 793

3. Three advanced courses selected from the following: GBS 700, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBS 793, GBS 700, GBS 713, GBS 720, INFO 673, INFO 793

7. Required every semester.
8. Required each fall and spring semester.
9. Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

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**Genetics, Genomics and Bioinformatics (GGB) Theme - MSTP/ARISE**

**Requirements**

<table>
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<td>GBS Required Courses</td>
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<td>Journal Clubs</td>
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<tr>
<td>Three Advanced Courses</td>
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<td>MSTP/ARISE Required Courses</td>
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<td>MSTP 794 Translational Research Seminar</td>
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1. Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBS 786, GBS 787, GBS 727, GBS 729, GBS 744, GBS 747 |

2. Required each fall and spring semester.
### Immunology (IMM) Theme - MSTP/ARISE

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<td>MSTP 795 Continuing Clinical Education</td>
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1. Required each fall and spring semester
2. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBS 732, GRD 709, or other approved course
3. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
4. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 786J, GBS 793, GBS 700, GBS 713, GBS 720, INFO 673, INFO 793

### Microbiology (MIC) Theme - MSTP/ARISE

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<td>GBS 764 Introduction to Structural Biology Methods</td>
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<td>GBS 768 Communicating Science: Reading, Writing and Presentation</td>
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<td>Advanced Courses</td>
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1. Required each fall and spring semester
2. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBS 768, GBS 726, GRD 709, or other approved course
3. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
4. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 786J, GBS 793, GBS 700, GBS 713, GBS 720, INFO 673, INFO 793
Three advanced courses selected from the following:
GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course

- Required every semester
- Required each fall and spring semester
- Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

### Neuroscience (NEURO) Theme - MSTP/ARISE

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<tr>
<td>GBSC 744 Neuroanatomy</td>
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<td>GBS 714 Developmental Neuroscience</td>
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<td>GBS 737 Neuro Student Summer Seminar Series 1</td>
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<td><strong>Research Hours</strong></td>
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| Total Hours                      | 79    |

1. Required each summer semester
2. Required each fall and spring semester
3. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course
4. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
5. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793

### Pathobiology, Pharmacology, & Physiology (P³) Theme - MSTP/ARISE

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<td>GBS 750 Intro to Physiology</td>
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<td>GBS 751 Intro to Physiology II</td>
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<td>GBS 752 Intro to Pathobiology</td>
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<td>GBS 753 Intro to Pharmacology &amp; Toxicology</td>
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| Total Hours                      | 76    |

1. Required each fall and spring semester
2. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course
3. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
4. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.

- Required every semester
- Required each fall and spring semester
- Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

### Courses

**PSDO 630. Physician Experience. 2 Hours.**

PSDO 630 will provide practical information and experience for highly qualified students considering medical school or other health-care based professional programs. The course will emphasize real world considerations of the clinical professions including acceptance criteria, expected duration of training, average debt and compensation of various specialties. The students will also be given multiple opportunities to interact with individuals from various levels of training and backgrounds to provide focused and nuanced guidance. Finally, the course will incorporate a shadowing experience, providing students the opportunity to observe and interact with practitioners from across UAB in a variety of specialties and settings. Each student will be required to complete documentation for the UAB and Children’s hospital, as well as receiving clearance from UAB Employee Health, as well as completing an online HIPAA compliance module. Students are not permitted to shadow until each is complete.

**PSDO 698. Master’s Level Non-Thesis Research. 1-8 Hour.**

Students may perform independent study in a research laboratory setting. This work may contribute toward the concentration credits subject to program director approval.

**PSDO 699. Master’s Level Thesis Research. 1-8 Hour.**

Students perform independent study in a research laboratory setting. This work contributes directly to the completion of the degree and meets the degree requirements for graduation.

**PSDO 700. Pathway to Grant Submission. 2 Hours.**

This course is designed to give students a basic background in topics necessary to succeed as a physician scientist in today’s academic medical environment. Topics to be covered include the NIH funding system, how to write a fellowship, record keeping, authorship and publication, conflict of interest, animal and human subjects, and finding a mentor (Open to MD-PhD, ARISE-MD, and DMD-PhD students).

**PSDO 701. Career Development Grant Writing Workshop. 1 Hour.**

This course is designed to assist postdocs, residents, fellows, and rising junior faculty with the creation and submission of a K award or equivalent grant application. Topics to be covered include the NIH funding system, how to write a fellowship, how to submit animal protocols, and how to submit IRB forms. Individuals will be given a variety of reading assignments from which they will be expected to participate in group discussions and/or presentations. They will also be expected to prepare a fellowship application that will be submitted to an NIH Funding agency.