A letter from the program director

The Human Physiology Program in the Department of Health Sciences is dedicated to being more human. To us, this means we value each student, their unique perspectives, and their unique interests. As such, we try to provide a more human graduate experience by offering more inclusive and human-based coursework, advising students with full-time faculty, promoting networking and life skills, and intentionally preparing students for the next phase of their life.

The Human Physiology program has a stellar record for preparing students for successful admission to professional health care programs (MD, DO, DMD, PT, OT, etc.), but that is only part of the story. Our curriculum leads to successful careers in the booming life sciences industry, or even a distinguished career in academia. The Human Physiology major provides an alternative to the traditional biology degree, with a focus on studying systems/humans more than cells and reactions. Our curriculum expands upon the premedical requirements with the addition of classes such as gross human anatomy, exercise physiology, muscle physiology, neuroanatomy and neurophysiology, pulmonary pathophysiology, and cardiovascular pathophysiology. We also leverage our vast network of affiliated research laboratories to lend students a chance to get involved in scientific discovery, while also boosting their appeal to graduate/medical schools.

We want students and faculty that believe in the development of a holistic graduate student to be a part of our program. We have laid out a pathway that we believe will lead to success for students in the future, and we strive to maintain an environment that allows students to be engaged and enjoy their journey along this path. We believe our students will leave the Human Physiology program more prepared, more knowledgeable, and above all, more human.

Let’s enjoy the journey together,

Dustin Allen, PhD

Director of the Human Physiology Program

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I. What is needed to graduate?

Degree Requirements
In order to graduate with a MS in Human Physiology, the following requirements must be met:

- A total of **33 course credits** at the graduate level (500+) must be completed.
  - Up to 8 hours of course work may be transferred from other institutions
- **16 course credits** must come from the Human Physiology program
- An overall **GPA of 3.0** must be maintained to graduate.
  - No grade less than C is acceptable for inclusion in the 33-semester-hour requirement
  - Students receiving 3 grades (or a total of 12 credits) **below C+ will be terminated** from the degree program.
  - No required course may be repeated more than once
    - An unacceptable grade received when a course is repeated will result in termination from the degree program
- An incomplete grade, ‘I’, must be completed **no later than one calendar year** of the date on which the incomplete grade is reported.
  - An F will be assigned automatically and permanently if the coursework remains incomplete on the assigned date or twelve months after the I grade has been awarded, whichever comes first.
- All master's degree candidates must maintain **continuous registration** for academic credits (minimum: 0.5 credit hrs) during the Fall and Spring semesters of each year.
  - Failure to register will result in administrative withdrawal of the candidate and necessitate reapplication to continue the program.
- Degree candidates must be registered for academic credit or pay the continuing student fee during the final semester in which the thesis defense is conducted, unless the thesis is being completed in the summer.
- An application for graduation must be completed by **February 1st**, prior to graduation and can be obtained from the **SAR Academic Services Center** (ASC).
  - Doctoral students must check with their advisor regarding their eligibility to participate
    - It is recommended that the dissertation defense be scheduled by **mid-April** for May graduation

Curriculum Requirements
The Human Physiology curriculum is posted in more detail online, and can be found at [this link](https://www.bu.edu/sargent/academics/departments-programs/health-sciences/master-of-science-in-human-physiology/).
Preclinical Accelerated Program

The preclinical accelerated track is **33 credits**, with a final paper “Critical Literature Review (SAR HS 793)” as the capstone of the program. Out of these 33 credits, **16 credits** must be taken in the Human Physiology program. This program is meant to be completed in 2 semesters.

<table>
<thead>
<tr>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPH BS 704 Introduction to Biostatistics</td>
<td>HP Elective</td>
</tr>
<tr>
<td>* Required Course, parenthesis indicates # of credit hours</td>
<td></td>
</tr>
<tr>
<td>SAR HS 750 The Physiologist’s Toolbox</td>
<td>HP Elective</td>
</tr>
<tr>
<td>HP Elective see list below</td>
<td>see list below</td>
</tr>
<tr>
<td>HP Elective see list below</td>
<td>General Elective HP, BI, SPH, GMS, etc.</td>
</tr>
<tr>
<td>General Elective HP, BI, SPH, GMS, etc.</td>
<td>SAR HS 793 Critical Literature Review</td>
</tr>
</tbody>
</table>

**Human Physiology Electives:**

SAR HS 541 Physiology Across the Lifespan (4, F)
SAR HS 542 Exercise Physiology (4, B)
SAR HS 592 Muscle Physiology (4, S)
SAR HS 550 Neural Systems (4, S)
SAR HS 572 Pulmonary Pathophysiology (4, S)
SAR HS 575 Cardiovascular Pathophysiology (4, F)
SAR HS 581 Gross Human Anatomy (4, B)
SAR HS 582 Neuroanatomy/Neurophysiology (4, S)
SAR HS 710 Graduate Field Experience (V, B)
SAR HS 745 Advanced Regional Anatomy (V, B)
SAR HS 755 Readings in Neuroscience (4, S)
SAR HS 776 Nutritional Epidemiology (4, F)
SAR HS 791 Directed Study/Research (V, B)
SAR HS 793 Critical Literature Review (4, S)

**General Electives (not a complete list)**

SAR HP 565 Biomechanics
SAR HP 771 Foundations of Motor Control
SAR HP 782 Advanced Human Movement
SAR PT 520 Functional Anatomy
CAS BB 522 Molecular Biology Laboratory
CAS BI 525 Biology of Neurodegenerative Diseases
CAS BI 560 Systems Biology
CAS CN 500 Computational Methods in Cognitive and Neural Systems
GRS BI 755 Cellular and Systems Neuroscience
GRS BI 655 Developmental Neurobiology
GRS BI 756 Systems & Behavioral Neuroscience
GRS CH 621 Biochemistry I
GRS CH 622 Biochemistry II
GMS AN 702 Neurobiology of Learning & Memory
GMS AN 707 Neurobiology of Aging
GMS AN 709 Neural Development and Plasticity
GMS AN 716 Developmental Cognitive Neuroscience
GMS AN 718 Methods in Neuroscience
GMS AN 777 Fund. of Cellular & Molecular Neuroscience
GMS AN 808 Neuroanatomical Basis of Neurological Disorders
GMS AN 811 Cognitive Neuroscience

Critical Literature Review Guidelines

In order to receive an A in SAR HS 793, there are 2 assignments that must be completed in accordance with the rubrics below.

Annotated Bibliography Rubric

<table>
<thead>
<tr>
<th>Topical relationship of sources to paper</th>
<th>Not Acceptable</th>
<th>Emerging</th>
<th>Developing</th>
<th>Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most sources are not adequately related to topic.</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Many sources are only marginally related to topic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most sources are clearly related to topic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All sources are clearly related to topic.</td>
<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality and authority of sources selected</th>
<th>Not Acceptable</th>
<th>Emerging</th>
<th>Developing</th>
<th>Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most sources are of poor, unreliable, or indeterminate quality and authority.</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Many sources are of marginal quality and authority.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most sources appear reliable and of good quality and authority.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sources appear reliable, authoritative and of good or high quality.</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality &amp; clarity of the summary of ideas in sources</th>
<th>Not Acceptable</th>
<th>Emerging</th>
<th>Developing</th>
<th>Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summaries appear to be possibly plagiarized or main ideas are unclear or misrepresented.</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Main ideas are not summarized clearly; or, summaries are simply incomplete or sketchy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main ideas of sources are clearly summarized.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main ideas of sources, including nuances and subtleties, are clearly summarized.</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Representation &amp; discussion of relevance of sources to paper or project</th>
<th>Not Acceptable</th>
<th>Emerging</th>
<th>Developing</th>
<th>Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>No attempt is made to relate ideas in sources to paper topic.</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Attempt to relate ideas in sources to paper or project topic results in inaccurate representations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attempt is to relate ideas in sources to paper topic or project sometimes fuzzy or unclear.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship of ideas in sources to paper topic or project clearly described.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quantity of sources cited</th>
<th>Not Acceptable</th>
<th>Emerging</th>
<th>Developing</th>
<th>Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fails to include the required number of sources.</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Fails to include an adequate number of sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Includes the required or minimal number of sources.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Includes the required or an appropriate number of sources.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Accuracy of the citations</th>
<th>Not Acceptable</th>
<th>Emerging</th>
<th>Developing</th>
<th>Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citations incomplete, errors are major and numerous.</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Citations are incomplete, errors numerous.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citations are mostly complete and errors minor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citations are complete and errors minor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL: \[ \text{ } / 60 = \text{ } \% \]

For an example of this type of writing assignment, follow this link:
https://owl.purdue.edu/owl/general_writing/common_writing_assignments/annotated_bibliographies/annotated_bibliography_samples.html
## Final Paper Rubric

<table>
<thead>
<tr>
<th></th>
<th>10 Exemplary</th>
<th>6 Satisfactory</th>
<th>2 Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction &amp; Rationale</strong></td>
<td>Provides a clear background, rationale, purpose of the paper. Written to an audience of non-specialists</td>
<td>Provides background research into the topic and describes the purpose, but lacks details in rationale/justification.</td>
<td>Provides background research into the topic but does not describe the purpose; Section lacks direction. Tone fails to explain details to non-specialists.</td>
</tr>
<tr>
<td><strong>Body</strong></td>
<td>Presents easy-to-follow topics that are logical and adequately detailed; There is plenty of scientific support for the positions described</td>
<td>Presents interesting topics but lacks details or scientific support</td>
<td>Misses natural progression; no scientific evidence supporting any position.</td>
</tr>
<tr>
<td><strong>Discussion &amp; Conclusions</strong></td>
<td>Presents a logical explanation for position; addresses recommendations and/or implications for further research or use/application</td>
<td>Presents a logical explanation for position</td>
<td>Does not adequately explain position</td>
</tr>
<tr>
<td><strong>References</strong></td>
<td>At least 20 original research articles are cited in the text. Reference list is included and formatted appropriately</td>
<td>Citations are cited, but sometimes from incorrect sources. Reference list has some formatting issues, but is included</td>
<td>No citations were utilized, no reference list is included.</td>
</tr>
<tr>
<td><strong>Mechanics &amp; Documentation</strong></td>
<td>Is free or almost free of errors of grammar, spelling, and writing mechanics; appropriately documents sources</td>
<td>Has errors but they don’t represent a major distraction; documents sources</td>
<td>Has many errors that obscure meaning of content or add confusion; neglects important sources or documents few to no sources</td>
</tr>
</tbody>
</table>

TOTAL: ___________ / 50 = _____________ %

For an example of an original research paper, follow this link: [https://www.researchgate.net/publication/332447135_How_to_write_an_Original_Article](https://www.researchgate.net/publication/332447135_How_to_write_an_Original_Article)

For an example of a review article, follow this link: [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3715443/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3715443/)
Research Track

The research track is **33 credits**, with a thesis defense as the capstone of the program. Out of these 33 credits, **16 credits** must be taken in the Human Physiology program. This program is meant to be completed in 2 years. Students are usually enrolled full-time (12+ credits) in the Fall and Spring semester of their first-year study, and part-time (less than 12 credits per semester) in the second year of their study dedicating their time to research. A candidate, after successfully completing a thesis project, will present it orally in a session open to the public. Following this defense, a thesis must be sent to the library prior to graduation.

The decision to pursue a thesis should be agreed upon by a faculty member who is willing to serve as the research adviser. A faculty member in the human physiology program must agree to become the student's academic adviser and serve as the first reader on the thesis. The academic adviser will assist the student in identifying a topic for thesis research either in their lab, or at an affiliated/local laboratory.

If the nature of the thesis project is such that an affiliation must be established with another laboratory or institution, arrangements between the Department of Health Sciences and the external investigator or facility must be completed prior to initiation of the research. These arrangements include agreement of the external investigator to participate in research supervision and serve as the second reader. Once the specific research mentor from a given institution and research lab is finalized between the student and the faculty member, notification should be given to the Human Physiology Program Director, so that the student's records can be updated.

- **The thesis committee** will consist of **two** members who are involved in and/or are knowledgeable about the thesis topic area.
  - At least one of the advisors must be a full-time member of the departmental faculty.

- **Required steps for completing a thesis:**
  - Plan project with advisor/research mentor
  - Thesis proposal meeting (with all committee members)
  - Data collection
  - Data analysis
  - Oral presentation
  - Submission of written thesis

The Mugar Library has published a guide for Dissertations and Theses ([http://library.bu.edu/theses](http://library.bu.edu/theses)). These instructions should be carefully studied before initiating preparation of the thesis.
## Sample Research Track Curriculum

<table>
<thead>
<tr>
<th></th>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPH BS 704</td>
<td>Introduction to Biostatistics (3)</td>
<td>HP Elective</td>
</tr>
<tr>
<td>SAR HS 750</td>
<td>The Physiologist’s Toolbox (2)</td>
<td>HP or General Elective</td>
</tr>
<tr>
<td>HP Elective</td>
<td>see list below</td>
<td>see list below</td>
</tr>
<tr>
<td>HP Elective</td>
<td>see list below</td>
<td>SAR HS 791</td>
</tr>
<tr>
<td><strong>2nd Year</strong></td>
<td></td>
<td>Directed Study &amp; Research (4)</td>
</tr>
<tr>
<td>SAR HS 791</td>
<td>Directed Study &amp; Research (4)</td>
<td>SAR HS 791</td>
</tr>
<tr>
<td>SAR HS 791</td>
<td>Directed Study &amp; Research (4)</td>
<td>Directed Study &amp; Research (4)</td>
</tr>
</tbody>
</table>

*Required Course, parenthesis indicates # of credit hours*

### Human Physiology Electives:
- SAR HS 534 Physiology of Sex (4, S)
- SAR HS 541 Physiology Across the Lifespan (4, F)
- SAR HS 542 Exercise Physiology (4, B)
- SAR HS 592 Muscle Physiology (4, S)
- SAR HS 550 Neural Systems (4, S)
- SAR HS 572 Pulmonary Pathophysiology (4, S)
- SAR HS 575 Cardiovascular Pathophysiology (4, F)
- SAR HS 581 Gross Human Anatomy (4, B)
- SAR HS 582 Neuroanatomy/Neurophysiology (4, S)
- SAR HS 710 Graduate Field Experience (V, B)
- SAR HS 745 Advanced Regional Anatomy (V, B)
- SAR HS 755 Readings in Neuroscience (4, S)
- SAR HS 776 Nutritional Epidemiology (4, F)
- SAR HS 791 Directed Study/Research (V, B)
- SAR HS 793 Critical Literature Review (4, S)

### General Electives (*not a complete list*)
- SAR HP 565 Biomechanics
- SAR HP 771 Foundations of Motor Control
- SAR HP 782 Advanced Human Movement
- SAR PT 520 Functional Anatomy
- CAS BB 522 Molecular Biology Laboratory
- CAS BI 525 Biology of Neurodegenerative Diseases
- CAS BI 560 Systems Biology
- CAS CN 500 Computational Methods in Cognitive and Neural Systems
- GRS BI 755 Cellular and Systems Neuroscience
- GRS BI 655 Developmental Neurobiology
- GRS BI 756 Systems & Behavioral Neuroscience
- GRS CH 621 Biochemistry I
- GRS CH 622 Biochemistry II
- GMS AN 702 Neurobiology of Learning & Memory
- GMS AN 707 Neurobiology of Aging
- GMS AN 709 Neural Development and Plasticity
- GMS AN 716 Developmental Cognitive Neuroscience
- GMS AN 718 Methods in Neuroscience
- GMS AN 777 Fund. of Cellular & Molecular Neuroscience
- GMS AN 808 Neuroanatomical Basis of Neurological Disorders
- GMS AN 811 Cognitive Neuroscience

# Thesis Guidelines

<table>
<thead>
<tr>
<th></th>
<th>Excellent (7.1 – 8 pts)</th>
<th>Good (6 – 7 pts)</th>
<th>Fair (0 – 5.9 pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abstract</strong></td>
<td>• STATES PURPOSE OF STUDY.</td>
<td>• STATES PURPOSE OF STUDY.</td>
<td>• MISSING OR UNCLEAR PURPOSE OF STUDY.</td>
</tr>
<tr>
<td></td>
<td>• CONCISELY SUMMARIZES RESULTS, CONCLUSIONS, &amp; INTERPRETATION.</td>
<td>• SUMMARY IS WEAK OR LACKING IN CONTEXT.</td>
<td>• SUMMARY IS WEAK &amp; LACKS CONTEXT.</td>
</tr>
<tr>
<td><strong>Background &amp; Significance</strong></td>
<td>16.1 – 18 pts</td>
<td>12 – 16 pts</td>
<td>0 – 11.9 pts</td>
</tr>
<tr>
<td></td>
<td>• ESTABLISHES RESEARCH QUESTION, CONTEXT, &amp; SIGNIFICANCE.</td>
<td>• RESEARCH QUESTION NOT CLEARLY STATED; WEAK CONTEXT &amp; SIGNIFICANCE.</td>
<td>• RESEARCH QUESTION, CONTEXT &amp; OR SIGNIFICANCE MISSING.</td>
</tr>
<tr>
<td><strong>Research Design &amp; Methods</strong></td>
<td>16.1 – 18 pts</td>
<td>12 – 16 pts</td>
<td>0 – 11.9 pts</td>
</tr>
<tr>
<td></td>
<td>• COMPREHENSIVE &amp; ACCURATE DESCRIPTION</td>
<td>• ADEQUATE DESCRIPTION</td>
<td>• WEAK DESCRIPTION</td>
</tr>
<tr>
<td></td>
<td>• REASONING BEHIND METHODOLOGY &amp; ANALYSIS CLEARLY EXPLAINED.</td>
<td>• REASONING BEHIND METHODOLOGY &amp; ANALYSIS NOT ALWAYS CLEARLY EXPLAINED.</td>
<td>• REASONING BEHIND METHODOLOGY &amp; ANALYSIS MISSING OR INADEQUATE.</td>
</tr>
<tr>
<td><strong>Results &amp; Discussion</strong></td>
<td>16.1 – 18 pts</td>
<td>12 – 16 pts</td>
<td>0 – 11.9 pts</td>
</tr>
<tr>
<td></td>
<td>• CLEAR &amp; LOGICAL DATA PRESENTATION</td>
<td>• DATA PRESENTATION ADEQUATE BUT SOMEWHAT LACKING IN CLARITY.</td>
<td>• POOR DATA PRESENTATION.</td>
</tr>
<tr>
<td></td>
<td>• CRITICALLY ANALYZES &amp; EVALUATES FINDINGS VS LITERATURE.</td>
<td>• ANALYSIS &amp; EVALUATION OF FINDINGS LESS STRONGLY BASED IN EXISTING LITERATURE.</td>
<td>• WEAK ANALYSIS OF FINDINGS VS LITERATURE.</td>
</tr>
<tr>
<td></td>
<td>• DRAWS APPROPRIATE CONCLUSIONS &amp; FUTURE DIRECTIONS</td>
<td>• CONCLUSIONS &amp; DIRECTIONS FOR FUTURE RESEARCH LESS OBVIOUS</td>
<td>• INAPPROPRIATE OR MISSING CONCLUSIONS; ILOGICAL OR MISSING IMPLICATIONS.</td>
</tr>
<tr>
<td><strong>Writing</strong></td>
<td>9.1 – 10 pts</td>
<td>8 – 9 pts</td>
<td>0 – 7.9 pts</td>
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<tr>
<td></td>
<td>• ORGANIZATION EXCEPTIONALLY CLEAR.</td>
<td>• ORGANIZATION AND WRITING GOOD, THOUGH NOT EXCEPTIONAL.</td>
<td>• POORLY ORGANIZED AND NOT WELL WRITTEN.</td>
</tr>
<tr>
<td></td>
<td>• WRITING COHESIVE.</td>
<td></td>
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</tr>
<tr>
<td><strong>Professionalism</strong></td>
<td>9.1 – 10 pts</td>
<td>8 – 9 pts</td>
<td>0 – 7.9 pts</td>
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<td>• TOOK INITIATIVE.</td>
<td>• WRITING COHESIVE</td>
<td>• RARELY TOOK INITIATIVE.</td>
</tr>
<tr>
<td></td>
<td>• MAINTAINED CLEAR LINES OF COMMUNICATION.</td>
<td>• USUALLY TOOK INITIATIVE.</td>
<td>• RARELY MAINTAINED CLEAR LINES OF COMMUNICATION.</td>
</tr>
<tr>
<td></td>
<td>• TOOK RESPONSIBILITY FOR ACTIONS.</td>
<td>• USUALLY, MAINTAINED CLEAR LINES OF COMMUNICATION.</td>
<td>• RARELY TOOK RESPONSIBILITY FOR ACTIONS.</td>
</tr>
<tr>
<td><strong>Oral Presentation</strong></td>
<td>16.1 – 18 pts</td>
<td>12 – 16 pts</td>
<td>0 – 11.9 pts</td>
</tr>
<tr>
<td></td>
<td>• PREPARED, POISED AND CONFIDENT.</td>
<td>• SOMEWHAT LACKING IN PREPARATION OR CONFIDENCE.</td>
<td>• CLEARLY LACKED PREPARATION &amp; CONFIDENCE/POISE.</td>
</tr>
<tr>
<td></td>
<td>• ORGANIZED PRESENTATION THAT WAS EASY TO FOLLOW.</td>
<td>• TALK FAIRLY WELL ORGANIZED.</td>
<td>• POORLY ORGANIZED TALK THAT CONFUSES AUDIENCE.</td>
</tr>
<tr>
<td></td>
<td>• RESPONDS PROMPTLY AND APPROPRIATELY TO QUESTIONS.</td>
<td>• DIFFICULTY RESPONDING TO SOME QUESTIONS.</td>
<td>• CAN’T ANSWER MOST QUESTIONS.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>90 – 100 pts</td>
<td>70 – 89 pts</td>
<td>0 – 69 pts</td>
</tr>
</tbody>
</table>

See: [http://library.bu.edu/theses for thesis formatting guidelines.](http://library.bu.edu/theses)

Total score must be >70% for a passing grade.

Combined BS/MS in Human Physiology Program

Application & Degree Requirements:

a. Apply after completing 2 years of undergraduate study with minimum 3.2 GPA.
   i. One year of general chemistry, one year of organic chemistry, and one year of general biology must be completed by the end of 2nd year.

b. Application deadline is April 1 of 2nd year
   i. Official transcript must be submitted by June 1
   ii. Decision will be made ~July 1 for acceptance into program for the fall semester of the 3rd year.

c. To remain in the program, students must maintain a 3.00 GPA both cumulatively, and in the sciences, with no graduate level course grade below B-.

d. Students will begin master’s thesis research in their senior year.

e. Students will graduate with a BS degree at the end of their 4th year in the program.

f. By the end of their 5th year, students will have completed a master’s thesis and will graduate with an MS degree.

Important Note:

Following completion of the BS component of the BS/MS program, students are considered to be “graduate status”. This impacts scholarship amount, qualification for specific loans, tuition, and other forms of financial aid. Speak with Jasmine Samuels, Assistant Director of Graduate Financial Aid, for more information on this process.
## Example BS/MS Curriculum

<table>
<thead>
<tr>
<th>1st Year</th>
<th>2nd Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st Semester</strong></td>
<td><strong>2nd Semester</strong></td>
</tr>
<tr>
<td>CAS BI 107</td>
<td>Biology I</td>
</tr>
<tr>
<td>CAS CH 101</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CAS WR 120</td>
<td>First-Year Writing Seminar</td>
</tr>
<tr>
<td>CAS PS 101</td>
<td>General Psychology</td>
</tr>
<tr>
<td>SAR HP 150</td>
<td>First-Year Sargent Seminar</td>
</tr>
<tr>
<td>CAS BI 203</td>
<td>Cell Biology</td>
</tr>
<tr>
<td>CAS CH 203</td>
<td>Organic Chemistry I</td>
</tr>
<tr>
<td>CAS MA 121</td>
<td>Calculus for the Life and Social Sciences I</td>
</tr>
<tr>
<td>HUB Electives</td>
<td><strong>HUB Course List</strong></td>
</tr>
<tr>
<td>CAS CH 421</td>
<td>Biochemistry I</td>
</tr>
<tr>
<td>CAS PY 105</td>
<td>Elementary Physics I</td>
</tr>
<tr>
<td>SAR HS 251</td>
<td>Human Nutrition Science</td>
</tr>
<tr>
<td>SAR HP 353</td>
<td>Organization &amp; Delivery of Health Care in the US</td>
</tr>
<tr>
<td>SAR HS 369</td>
<td>Gross Human Anatomy</td>
</tr>
<tr>
<td>SAR HS 375</td>
<td>Cardiovascular Pathophysiology</td>
</tr>
<tr>
<td>SAR HS 791</td>
<td>Directed Study and Research (MS course)</td>
</tr>
<tr>
<td>HUB Elective or HP Elective</td>
<td><strong>HUB Course List</strong> or <strong>HP Elective List (below)</strong></td>
</tr>
<tr>
<td>SAR HS 750</td>
<td>The Physiologist’s Toolbox</td>
</tr>
<tr>
<td><strong>3rd Year</strong></td>
<td><strong>4th Year</strong></td>
</tr>
<tr>
<td>CAS BI 552</td>
<td>Molecular Biology I (w/ discussion)</td>
</tr>
<tr>
<td>HP Elective</td>
<td><strong>HP Elective List (below)</strong></td>
</tr>
<tr>
<td>SAR HS 791</td>
<td>Directed Study and Research (MS course)</td>
</tr>
</tbody>
</table>

### A Sample of Elective Options

- SAR HS 331 Physiology of Sex and Human Reproduction (Spring) **undergraduate level**
- SAR HS 534 Physiology of Sex and Human Reproduction (Spring) **graduate level**
- SAR HS 341 Physiology Across the Lifespan (Fall) **undergraduate level**
- SAR HS 541 Physiology Across the Lifespan (Fall) **graduate level**
- SAR HS 362 Muscle Physiology (Spring) **undergraduate level**
- SAR HS 592 Muscle Physiology (Spring) **graduate level**
- SAR HS 370 Neuroanatomy and Neurophysiology (Spring) **undergraduate level**
- SAR HS 582 Neuroanatomy and Neurophysiology (Spring) **graduate level**
- SAR HS 371 Pulmonary Pathophysiology (Spring) **undergraduate level**
- SAR HS 572 Pulmonary Pathophysiology (Spring) **graduate level**
- SAR HS 375 Cardiovascular Pathophysiology (Fall) **undergraduate level**
- SAR HS 575 Cardiovascular Pathophysiology (Fall) **graduate level**
- SAR HS 550 Neural Systems (Spring) **graduate level**
- SAR HS 710 Graduate Field Experience: Human Physiology (Fall or Spring)
- SAR HS 745 Advanced Regional Anatomy (Fall or Spring)
- SAR HS 755 Readings in Neuroscience (Spring)
- CAS BI 520 Sensory Neurobiology (Fall)
- CAS BI 576 Carcinogenesis (Spring)
- GRS BI 645 Cellular and Molecular Neurophysiology (Fall)
- GRS BI 681 Molecular Biology of the Neuron (Spring)
- GRS BI 735 Advanced Cell Biology (Fall)
- GRS BI 755 Cellular and Systems Neuroscience (Fall)

II. Special Circumstances

Academic Probation
Any student whose grade point average is below a 3.0 will be placed on academic probation and will be notified by Sargent College. To remove the probationary status from the academic record, a student must achieve a 3.0 GPA in the following semester, or they will be terminated from the program.

- **Remember:** No grade less than C is acceptable for inclusion in the 33-semester-hour requirement. Students receiving 3 grades (12 credits) below a C+ will be terminated from the program. No course required by the for the program may be repeated more than one time. An unacceptable grade received when a course is repeated will result in termination from the degree program.

A letter is sent to each student informing him/her of academic probation status. Copies of this letter are sent to the faculty advisor/s. Students on probation are encouraged to seek advice from an academic counselor at the college.

Dismissal
Boston University, through its various faculties and appropriate committees, reserves the right to suspend or dismiss any student for failure to maintain a satisfactory academic record, acceptable personal behavior, or satisfactory standards of health. Copies of Boston University’s Code of Student Responsibilities are available from the Office of the Dean of Students, East Tower, George Sherman Union, 775 Commonwealth Avenue, Boston, MA 02215.

Students absent from classes more than two days for illness should be under a doctor’s care. Students who are absent five days or more for illness should present to Student Health Services a certificate of fitness from their physician or be examined at the University Clinic.

Leave of Absence
A leave of absence may be requested by petition for specified lengths of time provided an explanation is presented. Such a petition should be formulated with the guidance of the ASC Office and subsequently addressed and presented to the Program Director. Candidates must complete their program within five years from the first semester of matriculation and must submit an Application for Graduation at least three months prior to the expected date of graduation. These can be obtained from the Academic Services Center (Room 207).

Termination of Enrollment and Appeal Process
No grade less than C is acceptable for inclusion in the 33-semester-hour requirement. Students receiving 3 grades (12 credits) below a C+ will be terminated from the program. No course required by the for the program may be repeated more than one time. An unacceptable grade received when a course is repeated will result in termination from the degree program.

Students may appeal this decision and file a formal petition can be submitted to the College Academic Policies and Procedures Committee by contacting the Academic Services Center (SAR Room 207).

III. Standards & Procedures

Sargent College has a commitment to excellence in the education of Health and Rehabilitation Professionals. Individually and collectively, those associated with Sargent are responsible for maintaining and promoting those ethical standards below:

Academic Honesty

Sargent College of Health and Rehabilitation Sciences is committed to creating an intellectual community in which both faculty and students participate in the free and uncompromising pursuit of learning. This is possible only in an atmosphere of mutual trust where the discovery and communication of truth are marked by scrupulous, unqualified honesty. The college expects all students to adhere strictly to the accepted norms of intellectual honesty in their academic and clinical work. It is the responsibility of the student to abide by the Sargent College Academic Conduct Code that is distributed annually to each student at the college.

https://www.bu.edu/academics/policies/academic-conduct-code/

Attendance

Students are expected to attend each class session unless they have a valid reason for being absent. Students may be required at any time to account for undue irregularity in attendance, either by personal explanation to their faculty advisor or dean or by written statement from a parent or another authority. Any student who has been excessively absent from a course may be required to withdraw from that course without credit. Students who expect to be absent from class for more than five days should notify their dean promptly.

Absence for Religious Reasons

Religious Holidays: According to Chapter 151C of the General Laws, Commonwealth of Massachusetts, any student in an educational or vocational training institution, other than a religious or denominational educational or vocational training institution, who is unable, because of his or her religious beliefs, to attend classes or to participate in any examination, study, or work requirements on a particular day, shall be excused from any such examination or study or work requirement, and shall be provided with an opportunity to make up such examination, study, or work requirement that may have been missed because of such absence on any particular day; provided, however, that such makeup examination or work shall not create an unreasonable burden upon such school.

- Please identify potential schedule conflicts with religious observances *early in the semester* and communicate these to the course instructor. To avoid misunderstandings, the agreed-upon arrangement should be put in writing/email. If the instructor and student cannot agree on an accommodation, the advice of the college Dean’s office should be sought.

Disability Accommodations
Boston University provides reasonable accommodations to eligible individuals with disabilities in conformance with Section 504 of the Rehabilitation Act of 1973 and with the Americans with Disabilities Act of 1990. Requests for disability accommodations must be made in a timely fashion to the Office of Disability Services, 19 Deerfield Street, Boston, MA 02215; 617-353-3658 (Voice/TTY). Students seeking accommodations must submit appropriate medical documentation and comply with the policies and procedures of the Office of Disability Services. Please see also, https://www.bu.edu/disability/accommodations/

Filing a Complaint for an Issue Regarding Academic Internships
Process for Filing a Complaint for an Issue Regarding Distance Education (including field placements, clinical rotations, and academic internships):

Boston University makes every attempt to resolve student complaints within its academic and administrative departments. Students should first attempt to resolve any concerns by utilizing existing University procedures.

The BU Compliance website and the Academic Bulletin provide information about ways that students and prospective students can report concerns and utilize University complaint procedures. The Massachusetts Department of Higher Education, in its capacity as the State Authorization Reciprocity Agreement (SARA) portal entity for Massachusetts, reviews and evaluates student complaints regarding distance education activities offered by Boston University in accordance with 610 CMR 12.07.

If an issue regarding distance education cannot be resolved internally, please see the process here.
IV. Full-Time Faculty & Staff in Human Physiology

Faculty

**Dustin Allen, PhD**
Senior Lecturer and Program Director, Pulmonary, & Exercise Physiology,

**Helen Barbas, PhD**
Professor, Neuroscience & Organization of Prefrontal Cortex

**Jesse Moreira, PhD**
Clinical Assistant Professor, Cardiovascular Physiology & Education

**Kathleen G. Morgan, PhD**
Professor, Cardiovascular Cell Biology & Cytoskeleton

**Kelley Pesanelli, PT, MSPT**
Senior Lecturer, Physical Therapy, Healthcare

**Lisa Roberts, PhD**
Lecturer, Physiology, Aging, Education

**Vasileios Zikopoulos, PhD**
Associate Professor, Neuroscience, Organization of Prefrontal Cortex in Autism

Staff

**Danuta (Danka) Charland, PhD, MCJ, CAGS**
Assistant to the Program Director
charland@bu.edu
Office: SAR - Rm 443D
Research Faculty Affiliated with Human Physiology

Christina M. Dieli-Conwright, PhD, MPH, CACSM, CSCS

Jingyan Han, PhD, (BUMED)

Claus Hilgetag, PhD

Deepak Kumar, PT, PhD (BU, SAR)

Cara Lewis, PT, PhD (BU, SAR)

Brandon Roberts, PhD (USARIEM)

LaDora Thompson, PhD (BU, SAR)