



Graduate Student Handbook

Neuromotor Science Program

**Temple University
College of Public Health
2018-2019**

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Section 1: Introduction to NMS Program

We welcome you to the Neuromotor Science (NMS) Graduate Program at Temple University. The study of human movement, both as an outcome of health and functioning and as a means to understand the mechanisms underlying neuromotor system integration and behavior, is foundational to many health professions. The skills needed to be successful in fields of related study require fluency across the disciplines of engineering, kinesiology, neuroscience, and rehabilitation. The need exists for rigorously trained scientists with interdisciplinary training in neuromechanics, neurobiology, and biomechanics of the sensorimotor system, and the impact of health conditions, disease, and disability on human movement. Our Neuromotor Science (NMS) program trains scientists to advance the science of neuromotor control and biomechanics of human posture and movement in individuals across the lifespan and spectrum of health and disability levels. The M.S. in Neuromotor Science (MS NMS) program is designed for individuals in the fields of Engineering, Exercise Science, Kinesiology, Occupational Therapy, Physical Therapy, Rehabilitation Science, and the like, preparing them to:

- advance the science and understanding of neuromotor processes, including assessment and evaluation of movement, neuromotor function and integration, and its impact on movement on health, functioning, and disability, and
- contribute to the development of interventions to improve human movement, particularly posture and locomotor control and function across the lifespan.

We have prepared this Handbook to help guide your academic and professional development as you progress through the Program. We believe that successful achievement of your goal to become a neuromotor scientist will be achieved through the mutual efforts of the faculty, administration, staff, and students. As such, we have constructed and adopted policies intended to assist in your development by assuring the highest quality professional education possible. Such topics as programs of study, admission standards and procedures, financial aid, and graduate faculty are covered. Full details of policies and procedures governing graduate programs, including the NMS program, at Temple University can be found at <http://www.temple.edu/grad/policies/gradpolicies.htm> for additional information. Graduate school forms can be accessed at: <http://www.temple.edu/grad/forms/>

Although advisors, faculty resources, and other members of the department and professional staff are here to assist you through various methods of contact, the final responsibility for compliance with all policies ultimately rests with you. **All students who are enrolled in the NMS graduate programs are expected to comply with all policies and standards of scholarship and academic performance as established by Temple University, the Graduate School, the College of Public Health (CPH), and the Departments of Kinesiology (KN) and Physical Therapy (PT).**

Section 2: Program Contact Information

If you have questions that are not answered in these materials, contact the NMS Graduate **Program Director:**

W. Geoffrey Wright, PhD
Department of Physical Therapy
Ritter Annex, room 635
1301 Cecil B. Moore Ave, Philadelphia, PA 19122
P: 1-215-204-9008
wrightw@temple.edu (email preferred mode of contact)

For administrative or application questions, please contact NMS Program Student Services Coordinator:

Sarah M. Carroll
Student Services Coordinator
College of Public Health: Physical Therapy
P: 1-215-204-9042
E: sarah.carroll@temple.edu

Section 3: Application and Curriculum Requirements

Applicants for the Neuromotor Science graduate degree programs will be evaluated using the criteria listed below.

Academic Achievement

Applicants must have a bachelor's degree or its equivalent from an accredited institution of higher learning and an overall grade point average (GPA) of at least 3.0 (on a 4-point grade scale). One copy of official transcripts are required from each institution of higher education attended by the applicant. It is the applicant's responsibility to request these transcripts. Please refer to the Application for Admission materials for details concerning the forwarding of transcripts. University Graduate School policy requires that applicants have an overall undergraduate GPA of 3.0 points (on a 4-point grade scale) for admission consideration. Exceptions to this policy can be met by one of the following criteria: a) standardized test scores at or above the 65th percentile, b) have achieved a 3.25 graduate GPA in at least 9 credit hours of didactic graduate coursework, or c) have a 3.5 or higher undergraduate GPA in the final 2 years of their degree program.

Analytical Skills

Applicants must demonstrate competency in analytical skills pertinent to their graduate goals. All graduate applicants (master's or doctoral) are required to take the Graduate Record Examination (GRE). Both the verbal and quantitative sections of the GRE are required. Recommended minimum GRE total score is at or above the 50th percentile. In addition, proficiency in analytical skills may be further supported through: (a) course work* providing prerequisite skills necessary for research and statistical understanding and other pertinent graduate course knowledge that are required by the program of study; and (b) previous experiences such as publication of research articles in which the student selects and interprets statistics or other quantitative applications in research related to the chosen area of graduate study.

Statement of Goals

Applicants are required to submit a 1-2 page written statement of their career/professional goals.

Resume (Curriculum Vitae: CV) and References

Applicants demonstrate the extent of experiences which may contribute to the assessment of their application by submitting a current resume (CV) which includes previous and current educational and work experiences; professional publications and presentations; memberships in professional organizations; certifications; attendance at professional conferences and workshops; and any other pertinent information. Applicants must also submit the names and contact information for two references. These contact individuals can be academic and/or professional references. You will need to provide the telephone and email contact information for these two individuals. Letters of recommendation are NOT required, but please alert the two references that they may be contacted during the application review process.

Portfolio

Applications may be enhanced by the inclusion of a portfolio which might include any other supporting materials (e.g. publications) which demonstrate the applicant's abilities in the program area of the application.

International Applicants

International applications have added requirements defined by the Graduate School. These requirements are detailed on the Graduate School website in the *Graduate School Manual* on the Policy Number 02.23.13 and Number 02.23.13.01 and can be viewed at:

<http://www.temple.edu/grad/policies/gradpolicies.htm>

Further details on international applications are described the *Prospective Students - International Application* website of the Graduate School at the following url:

<http://www.temple.edu/grad/admissions/international.htm>

If admitted and offered a Graduate Teaching Assistantship, international students must contact the International Teaching Assistant (ITA) program in order to assess their English fluency. Those ITAs whose country of origin

does not have English as its native language will be required to take the Speaking Proficiency English Assessment (SPEAK) Test. This test is administered by the Office of International Teaching Assistants Program and specifics (including exemptions) are detailed at the following url:

<http://www.temple.edu/ita/>

The Office of International Students and Scholar Services (ISSS) provides support services for all Immigration and Naturalization related requirements including the Certification of Eligibility requirements (I-20 or DS-2019) for international applicants. International students must be enrolled in a full-time (9 credit hours per semester) course of study to satisfy the regulations established by the Immigration and Naturalization Service concerning the issuance of a student visa. International students should contact the ISSS at the following site for further details:

International Students and Scholar Services

1700 North Broad Street

Suite 203B

Philadelphia, PA 19122 USA

215.204.7708

iss@temple.edu

<http://www.temple.edu/iss/index.html>

Application

Applicants can access and complete the on-line application at the Graduate School web site:

<http://www.temple.edu/grad/admissions/AccessGradApp.htm>

Progress of your application can be tracked by logging onto the same website listed above and opening your submitted application; updates on materials received will be posted.

Fee

A nonrefundable application fee must accompany the application. Refer to the above Graduate School's website for the specified amount of the application fee.

Supporting Materials

Supporting materials (i.e., official transcripts, resume [CV], statement of goals, and two references' contact information) are forwarded to the Department of Physical Therapy Student Services Coordinator, Ms. Sarah Carroll, at the address listed below. The recommended method of delivery is electronic mail.

Ms. Sarah Carroll

Student Services Coordinator

Department of Physical Therapy

Ritter Annex, room 637

1301 Cecil B. Moore Ave, Philadelphia, PA 19122

Temple University

Philadelphia, PA 19140

215.204.9042

sarah.carroll@temple.edu

Timelines

Review of the application occurs after the University online application is completed and all supporting documents described above have been received. To ensure maximum consideration for Fall semester admission it is recommended that the application be completed by January 2nd. Master's applications will be reviewed by March 1st and admissions decisions will be completed by April 15th. Doctoral applications, upon completion, will be reviewed on an ongoing basis.

Letters of Admission Decision

Applicants who are recommended for admission to the Neuromotor Science Program will receive two letters: the official letter from the Dean of the Graduate School informing the applicant of the admission decision; if the decision was favorable for admission, a second letter from the Doctoral NMS Program will follow. The NMS Program letter will familiarize the applicants with their faculty mentor, as well as supply the applicants with a Tuition Deposit Form. Tuition deposits ensure an applicant's respective place within the admitted Program for the semester in which admission is granted by the Graduate School. A one semester (or two semesters in rare cases) deferral for enrollment may be requested by the admitted applicant for consideration at the Program level. If the applicant does not enroll while the letter is valid, admission will be cancelled. If a new application is filed, a new application fee must accompany the application.

SECTION 4: MASTER'S AND DOCTORAL STUDENT INFORMATION

A master's or doctoral student is expected to maintain satisfactory progress toward degree completion. A student's graduate record begins with the first course credited to the degree and includes all subsequent courses, whether or not such work is necessary for the degree. A graduate student may earn no more than two grades of less than B-, may receive no more than one grade of F, must have at least a 3.0 GPA at graduation, and may not graduate with an outstanding incomplete (I) grade. Details of this Policy are described in section 02.24 of the Graduate School Policies and can be viewed at the following website

<http://www.temple.edu/grad/policies/gradpolicies.htm#GCSS24>

Curriculum Overview: Masters of Science in Neuromotor Science

Master's Degree in Neuromotor Science (30 CH Total)	
Required Courses (15 CH) Course Number (CH) Course Title	
Core Courses (15 SH)	
NMS 9621 (3 CH)	Neuromotor Science 1: Neural Factors
NMS 9624 (3 CH)	Neuromotor Science 2: Mechanics & Models
NMS 9627 (3 CH)	Neuromotor Science 3: Cognition & Learning
NMS 9623 (3 CH)	Neuromotor Science: Programming
NMS 9622 (3 CH)	Neuromotor Science: Instrumentation
Public Health (0 SH)	
HRPR 5001	Public Health (self-learning module)
Research Design & Statistics (3 CH)	
(3 CH)	Stats/ Res Design 1
Research Experience (3 CH)	
NMS 9654 (3 CH)	Laboratory Rotation and Seminar
Elective Course (9 CH)	
Varied	Graduate Level Cognate Courses

In addition to course work and research involvement, master's students are expected to work on a project that will be presented at a local conference or the CPH Research Day. While there is not a thesis requirement, MS students must conduct a mentored research project that is of publishable quality.

Curriculum Overview: PhD in Neuromotor Science

	PhD Program in Neuromotor Science Total)	(45 CH	CH
	CPH Required (3)		
HRPR 5001	HPRP5001 - Public Health Modules		0
PBHL 5500	Grantsmanship		3
	Core Courses (15 CH)		
NMS 9621 (3 CH)	Neuromotor Science 1: Neural Factors		3
NMS 9624 (3 CH)	Neuromotor Science 2: Mechanics & Models		3
NMS 9627 (3 CH)	Neuromotor Science 3: Cognition & Learning		3
NMS 9623 (3 CH)	Neuromotor Science: Programming		3
NMS 9622 (3 CH)	Neuromotor Science: Instrumentation		3
	Research Design & Statistics (9)		
CPH Courses preferred	Stats/ Res Design 1		3
	Stats/ Res Design 2		3
	Stats/ Res Design 3		3
	Research Experiences (0)		
HRPR 5999	Research Experience 1		0
HRPR 5999	Research Experience 2		0
	Electives (12)		12
	Qualifying Examination - Skills		1
	Qualifying Examination - Science		
	Dissertation Proposal		2
	Dissertation Research		3

As part of the HRPR 5999 courses and the dissertation writing process, PhD candidates are expected to publish at least one lead-author article in a peer-reviewed journal before completion of the program. Additionally, the format of the PhD dissertation chapters describing three research specific aims should be written as self-contained manuscripts in publishable format, with the expectation that findings will be submitted to peer-reviewed journals.

NMS Core Course Descriptions & Objectives

NMS 9621 Neuromotor Science: Neural Factors. 3 CH.

Description:

Current theories and research pertaining to the neural mechanisms underlying motor control, sensorimotor integration and motor learning will be introduced as a foundation for understanding functional movement and motor deficits. The roles of selected brain regions as they relate to different aspects of motor behavior will be discussed. Lesion studies will be presented to further demonstrate the impact of neural impairments on movement performance and motor learning. Application of neurophysiologic methods that evaluate the relationship between neural circuitry and human movement (e.g., EMG, MRI, PET, EEG, TMS) will be discussed.

Objectives:

1. Students will be able to identify how the neuroanatomy and neurophysiology of important brain regions jointly influence aspects of motor behavior.
2. Students will be able to synthesize current theories and research findings pertaining to the neural mechanisms of perception-action, motor control, sensorimotor integration and motor learning to explain both typical and impaired functional movement.
3. Students will be able to analyze computational models and lesions studies that explain movement performance and motor learning with neural impairment.
4. Students will be able to compare and contrast how neurophysiologic methods can be used to evaluate the relationship between neural circuitry and human movement (e.g., EMG, MRI, PET, EEG, TMS).
5. Students will be able to discuss neurophysiologic mechanisms of neural plasticity and the role in recovery of neuromotor function.

NMS 9624. Neuromotor Science: Mechanics and Models. 3 CH

Description:

Application of mechanical principles to static and dynamic models of human posture and movement and application of the mechanical properties of the link-segment systems and biological tissue are introduced in this course. Theoretical frameworks, computational, and statistical models (e.g., dynamical systems, equilibrium point, control theory, Bayesian) are introduced as a basis for understanding the organization of complex movement patterns. Interpretation of the model predictions is based on both healthy individuals and those with movement deficits. The first half of the course will focus on the development of the tools necessary to conduct biomechanics research, process the data, and perform biomechanical data analysis. The second half of the course will work through common biomechanics questions related to human movement in three dimensions.

Objectives:

1. Students will provide a theoretical basis for the analysis of human posture and movement;
2. Students will solve the equations of motion for selected problems in biomechanics;
3. Students will analyze major human movement tasks- reaching, posture, gait;
4. Students will compare and contrast different research methods available to provide data and insight into human movement;
5. Students will discuss major biomechanical issues such as segment interactions, bi-articular muscle function, Hill-type muscle models, optimization, and non-linear analysis of movement.

NMS 9627. Neuromotor Science: Cognition and Learning. 3 CH

Description:

This course focuses on current theories and research related to cognitive and learning processes that influence motor behavior. Objectives include examination of lifespan motor development and learning, attentional mechanisms, perceptual effects on motor output, implicit and procedural memory effects on motor control, automatic compensatory responses and/or strategies following injury or disease, and the factors that influence adaptation and learning to long and short term changes in the body or environment.

Objectives:

1. Students will examine basic principles and concepts about the role of cognition and perception in motor learning theory.
2. Students will be able to describe research on the effects of cognition on motor learning as it relates to various patient populations.
3. Students will be able to relate cognitive factors to their impact on motor learning changes through the lifespan.
4. Students will be able to describe how attention impacts the control of voluntary coordinated movement.
5. Students will compare and contrast how imaging and recording techniques (e.g. EEG, fMRI, TMS) inform us about high-level cortical contributions to motor learning.
6. Students will be able to evaluate various measurement techniques used to examine motor performance.
7. Students will be able to distinguish temporary changes in performance from the relatively permanent changes that accompany learning.

8. Students will be able to explain how pathophysiology affects cognitive processing involved in motor learning.
9. Students will engage in development of rehabilitative strategies based on cognition and motor learning theory and principles

NMS 9622 Neuromotor Science: Instrumentation. 3 CH

Description:

Instrumentation is an introduction to electrical components and circuits, and their role in the function of laboratory instrumentation. The main goal of this class is to develop the student's competence in managing the instrumentation and the quality of resultant data for motion analyses through an understanding of data acquisition equipment that is appropriate to their chosen research area. The student will be exposed to basic electronic design of filters, amplifiers, and A/D sampling as well as selected pieces of laboratory instrumentation. The class is organized in a lecture/lab structure.

Objectives:

1. Understand the basics of computer hardware and motion capture instrumentation systems
2. Gain exposure to electrical circuits systems and preliminary circuit analysis methods.
3. Demonstrate the ability to determine the possible sources of low quality data within the data acquisition and processing instrumentation and routinely practiced trouble shooting procedures for labs.
4. Demonstrate reliable and effective trouble shooting skills for data collection and experimentation.
5. To encourage students to think creatively about approaches to problem solving for motion analyses instrumentation.

NMS 9623 Neuromotor Science: Programming. 3 CH

Description:

This course is designed for students with little to no programming skills to help them with a general understanding of computer hardware, software, and the interaction between the two. Factors that make the use of the computer useful to neuromotor research will be presented. Basic computer architecture and operating systems will be discussed in this class. The student will gain a basic understanding of software programming logic and structures as well as signal processing techniques for analysis of human movement data. The goal of this course is for students to gain skills in basic programming for scientific data analysis of time series data with Matlab. In addition, students will also be exposed to software packages commonly used for movement analysis such as LabView, C, Visual-3D, and OPenSIM. The class is organized in a lecture/lab structure.

Objectives:

1. Understand basic foundations of computer programming
2. Have a basic understanding of how to test and debug computer programs
3. Have the ability and an appreciation for good documentation of computer programs
4. Understand basic algorithms for: data acquisition, data processing and management, data graphing and plotting, numerical analyses and exporting data for additional analyses or reports
5. Have working knowledge and basic skills of the MATLAB programming environment for movement analyses research
6. To gain exposure to other software commonly used in movement analysis such as LabView, Visual – 3D, and OpenSIM
7. Introduction to basic linear systems analysis techniques in the time and frequency domain.(e.g., correlation, spectral analysis).

NMS 9653 Grantsmanship. 3 CH

Description:

This course exposes the Ph.D. level student to the mechanisms and methods of acquiring funding for Behavioral and Somatic Science Research. Students will learn Grantsmanship - the skills required to write a grant proposal. Learning experiences consist of literature review, writing key sections of a grant application, and if applicable, subject recruitment or. Class time will be divided into lectures and discussion of assignments.

Objectives:

1. understand grant overview, funding mechanism and the processes
2. retrieve information about funding opportunities in their research field

3. choose a topic and develop Specific Aims and Significance & Innovation sections
4. critique the relevant literature supporting your idea
5. present a clear concise compelling presentation of their grant topics

NMS 9654 Laboratory Rotation and Seminar Science 3 CH

Description:

This course provides the student with an in-depth exposure to the laboratory methods and focus of a faculty member. Students will learn the conceptual basis for the research as well as technical skills such as instrumentation and data analyses pertinent to the areas of research that are core to the NMS program or in a cognate area of interest to the student. Two rotations (6 CH) are required for the Ph.D. degree and a single rotation (3CH) for MS degree students.

Objectives:

1. Understand the conceptual basis of the research of the laboratory
2. Understand the tools used to answer research questions within the lab's domain
3. To demonstrate emerging skills in the laboratory techniques and data processing of the laboratory
4. To appreciate how the laboratory research program addresses questions in neuromotor science
5. To gain experience organizing, acquiring and managing data and presenting results from a research question

Statistics or Research Design

[MS degree requires 3 CH; PhD degree requires 9 CH]

Any of the below courses, among others, could be used to fill this requirement.

- EBPI/PBHL 5002 [3 SH] Biostatistics
- EBPI/PBHL 5105 [3 SH] Epidemiology
- EBPI 8001 [3SH] Research Methods in Public Health
- PBHL 8012[3 SH] Multivariate Biostatistics
- EPSY 8625 [3 SH] Intermediate Education Statistics
- EPSY 8627 [3 SH] Introduction to Research Design
- EPSY 8825 [3 SH] Advanced Data Analysis
- EPSY 8826 [3 SH] Multivariate Research Methods
- EPSY 8827 [3 SH] Experimental Design

Elective Courses

[MS degree requires 9 CH; PhD degree requires 21 CH]

Electives are chosen from existing 5000, 8000 or higher course level to provide a cognate area based on the student's interests which could include for example courses in neuroscience, kinesiology, public health, rehabilitation science, teaching in higher education, psychology, engineering and independent studies. The Program director and faculty advisor will advise on selection and approve the courses.

Course Credit

A graduate student may take an upper level (3000 or higher) undergraduate course for graduate credit only where: (a) the course in question is an upper level undergraduate course and covers material which is germane to the student's area of study and which is not taught in any graduate course offered the same semester; (b) the student is required to do graduate level work in the course (more advanced work than is required of the undergraduates in the course), and the nature and extent of that work is specified in writing before the start of the course in a document signed by both the instructor and the student; (c) the student has the prior permission of the course instructor and the graduate chair of her or his program; and (d) the student pays graduate tuition for the course.

Information concerning advanced standing, transfer of credit, academic good standing, auditing, dismissals, and other graduate school policies may be found at the Graduate School's web site at

<http://www.temple.edu/grad/policies/gradpolicies.htm#DECE27>

In order to register for the Preliminary Examination requirement (NMS 9994), a student must have completed all coursework for the degree (i.e., Graduate School Policy # 02.27.11.01). In order to register for the Dissertation Proposal requirement (NMS 9998) the student must have successfully completed the Preliminary Examination requirement (i.e., Graduate School Policy # 02.28.12.01). Upon approval of all required coursework, examination requirements, and approved dissertation proposal, a doctoral student will be raised to doctoral candidacy by the Graduate School (i.e., Graduate School Policy # 02.27.13.01). In order to register for the Dissertation requirement (NMS 9999) the student must have doctoral candidacy status. Additionally, a doctoral candidate must register for NMS9999 in the term in which the dissertation oral examination is held (Graduate School Policy # 02.28.13).

Doctoral Examination and Dissertation Research

In order to register for the Preliminary Examination requirement (NMS 9994), a student must have completed all coursework for the degree (i.e., Graduate School Policy # 02.27.11.01). In order to register for the Dissertation Proposal requirement (NMS 9998) the student must have successfully completed the Preliminary Examination requirement (i.e., Graduate School Policy # 02.28.12.01). Upon approval of all required coursework, examination requirements, and approved dissertation proposal, a doctoral student will be raised to doctoral candidacy by the Graduate School (i.e., Graduate School Policy # 02.27.13.01). In order to register for the Dissertation requirement (NMS 9999) the student must have doctoral candidacy status. Additionally, a doctoral candidate must register for NMS 9999 in the term in which the dissertation oral examination is held (Graduate School Policy # 02.28.13).

All Ph.D. students must complete the following course requirement: NMS 9994 (Preliminary Examination). Doctoral students must register for 1 credit of NMS 9994 during the semester in which the preliminary examination is completed and during all semesters between the completion of course work and the completion of the preliminary examination.

The requirement for NMS 9994 Preliminary Exam will be a set of four exam questions to examine the doctoral students' competency in their subdiscipline. Three questions will examine the core NMS content knowledge, and a 4th question will cover research design and statistics. Additionally, the following criteria will be applied:

- a. Question format and content will be determined by the student's preliminary examination committee.
- b. The exam will take place at Temple University in the Department under direct supervision (i.e., a member will have ability to check in on the student in person) of the preliminary examination committee who will be responsible for review and assessment of performance.
- c. The preliminary exam committee will consist of at least 3 members, with at least one from outside the student's subdiscipline.
- d. Administration of the NMS 9994 Preliminary Exam questions will first be taken in a written format. After review of the student's written performance by the preliminary examination committee members, an oral examination will take place no more than 2 weeks following the written exam portion. The oral examination will be attended (in person or via conference call) by all of the preliminary examination committee members. The oral exam format will be determined by the committee. The committee will judge written and oral examination performances collectively and provide a grade of pass or fail.
- e. The student will have 2 opportunities to pass the Part 1 portion of the Preliminary Examination requirement.

Dissertation Requirements

NMS9998 (Pre-Dissertation Res) - Doctoral students must register for 1-3 credits of NMS 9998 during all semesters between completion of the preliminary examination and approval of the dissertation proposal by the Dissertation Sponsoring Committee. Once the dissertation proposal has been approved by the Dissertation Sponsoring Committee it is submitted to the Graduate School. Defense and submission of the dissertation proposal to the Graduate School requires that the research protocol be submitted for or have received approval by the Institutional Review Board (IRB). The student's research may begin upon the Graduate School's approval of the dissertation proposal and approval by the IRB.

NMS 9999 (Doctoral Dissertation) - After the dissertation proposal has been approved by the dissertation advisory committee and the Graduate School, doctoral students must register for a minimum of 1 credit of NMS 9999 each semester until the dissertation has been successfully defended, approved by the dissertation examination committee, and filed with the Graduate School. A minimum of 3 credits of NMS 9999 is required for graduation.

Dismissal from the PhD Program

Students who earn a substandard grade (e.g., less than B-), will receive a warning from the Graduate School. A student who receives more than two grades below "B-" or more than one grade of "F" is dismissed for failure to maintain satisfactory grades. Refer to Graduate School policy

www.temple.edu/grad/policies/gradpolicies.htm#GCSS24 (#02.24.11.01 to 02.24.11.05) for further details.

Students not making doctoral program progress (see Annual Program of Study Review document in Appendix B) will receive a warning letter from the Department Graduate Program Director in consultation with the student's PhD advisor and committee.

- a. The warning letter will specifically address the issues and recommend measures along with deadlines for remediation.
- b. Students who receive such warnings *may lose* University or departmental financial support.
- c. Students who fail to meet their remedial recommendations in the designated time frame will be dismissed.

SECTIONS 5 & 6: NMS PROGRAM POLICIES & PROFESSIONAL INFORMATION

Seminar & Research Activity Participation

A significant part of your graduate experience and success in your studies is your exposure and involvement in research experience. In addition to your academic experiences, All NMS students are expected to attend laboratory and seminar meetings, and to be an active participant in related laboratory experiences. NMS students should also be aware that laboratory experiences, and those that carry academic credits such as Independent studies, are separate activities from research or work completed as part of paid research assistantship or one's own dissertation research. You should not receive academic credit and stipend for the same body of work.

TEMOSC: Temple Movement Science Seminar Series

This seminar involves faculty and students from a wide range of disciplines including engineering, neuroscience, kinesiology, neuromotor science, and physical therapy. Attendance at the bi-weekly meeting is required unless the student advisor and program director are notified in advance of scheduling conflicts. In addition, students will be required to be active participants in discussions and to present at one or more seminar sessions while enrolled in the NMS Program. This seminar typically takes place during a weekday afternoon.

NeRVE Laboratory and NMS Program Open Houses and Tours

NMS graduate students are expected to be present for all laboratory and NMS open house events as requested by their advisor or the NMS program director. These events may take place during early evening or weekend hours and students will be strongly encouraged to participate.

Additional Seminars

Temple University offers a rich diversity of programs that complement neuromotor science. The NMS faculty will share information on other speaker seminars series and support and encourage your attendance as able.

College of Public Health Graduate Student Research Day

This event usually occurs in the Spring, and all graduate students are expected to attend the all-day event. In addition, students with active research projects will work with their faculty members to submit their work for presentation. Master's students will be expected to present in their 2nd year of study. Doctoral students will be expected to present in their 2nd year of study, and in all years after doctoral candidacy status is achieved.

External Funding

NMS students will work with faculty advisors, NSM program director, and other University faculty as appropriate to obtain external funding to support their studies and research. This is an important aspect of your education, and helps to establish you as an emerging scientist. Qualified NMS students are encouraged to apply for the National Institutes of Health (NIH) Loan Repayment Program (LRP) – deadlines usually are in the Fall. Additionally, students should consider applying for pre-doctoral fellowships.

Intellectual Property

As a NMS graduate student you are a member of the Temple University community and will abide by all Temple University technology development intellectual property requirements. As a member of your faculty advisor's laboratory, much of the creative work and intellectual property developed by you as a graduate student as a paid RA, course work or Independent studies may be jointly owned by your faculty advisor. Early discussion with the appropriate faculty, College and University officials is encouraged.

Policy on Authorship

Faculty will use specific published professional, scientific, or educational documents on authorship to establish authorship for the student research projects. The published guidelines should include the following principles:

1. Authorship should reflect the work done to complete the project, including intellectual effort, data collection, presentation, and publication
2. There should be agreement on a clearly specified method for determining authorship before the work is completed.

Policy on Responsible Conduct of Human Subjects Research

All faculty, students and personnel associated with the NMS Program activities are responsible to obtain and maintain appropriate training and certification in the responsible conduct of human research and patient privacy.

1. Evidence of training certification (CITI documents) will be maintained within each laboratory program.
2. Each individual is responsible for ensuring their activities are in compliance with all research regulations.
3. Student research is not automatically exempt from needing IRB review and approval. The student and faculty advisor are responsible for ensuring that their research is conducted in accordance with regulations.
4. Please note that Dissertation Proposal approval and advancement to candidacy requires the appropriate IRB approvals to be under review or approved.

**Information on research at Temple can be found at: <http://www.temple.edu/research/>
IRB specific information at: <http://www.temple.edu/research/regaffairs/index.html>**

Role of Faculty Resources

Each student is provided a faculty member as an advisor. Faculty can provide information to aid students in finding resources to deal with academic and personal issues, as well as career planning. Students are advised to contact their faculty advisor at least twice a semester to discuss academic status or other areas of concern or interest. At the beginning of the Fall semester of each year, the student will complete the "Individualized Development Plan" and review it with their faculty advisor. The complete, reviewed and approved IDP is turned into the Program Director by October 1st of each academic year. Please see the end of this document for the template or check the NMS Program Student Owlbox, where this form can also be found.

Section 7: Financial Assistance

Varieties of financial aid are available to full-time graduate students and are described on the following Graduate School website: <http://www.temple.edu/grad/finances/index.htm>
University financial support is available on a competitive basis for graduate teaching assistantships (TA), research assistantships (RA), academic internships (AI), and University fellowships.

Teaching Assistantships (TA)

The Departments of Kinesiology and Physical Therapy have limited TA positions, and all positions are not vacated each year. Students who fill these positions are assigned to duties within the department. These may include: teaching laboratory sections of undergraduate core courses such as Biomechanics, Physiology of Physical Activity, and Human Anatomy and Physiology; teaching within the professional PT program if appropriately credentialed; supporting the teaching of other undergraduate core courses; or teaching activity courses in a variety of physical activity and sports courses for the general university student population. To be considered for an assistantship, applicants must already be admitted by the Graduate School and advocated by their faculty mentor to the Program Director for assistantship consideration.

Recipients of positions with instructional responsibilities will be required to attend an orientation and training workshop provided by the Teaching and Learning Center in mid/late August. As stated previously in the International Applicants section, if an international student whose country of origin does not have English as its native language is offered a Graduate Teaching Assistantship, the student will be required to take the Speaking Proficiency English Assessment (SPEAK) Test. This test is administered by the Office of International Teaching Assistants Program and specifics are detailed at the following url:

http://www.temple.edu/ita/speak_test.html

Benefits to include tuition remission, living stipend, and Health Insurance subsidy accorded to TAs are defined by the contractual agreement between the Temple University Graduate Students Association (TUGSA) and Temple University and as such will vary by contractual year.

Each TA will be assigned a work load which is the equivalent of 20 hours per week. Specific loads to meet the 20 hour per week assignment will vary with workload assignment. All recipients of these awards must be enrolled in 6-9 credits of graduate coursework each academic semester to maintain their full-time status and financial assistance. Exceptions to this are for doctoral students in the final non-didactic phases of their degree program.

Master's degree students are eligible for 2-year appointments; doctoral students are eligible for 4-year appointments which are predicated on satisfactory progress in the graduate degree program and satisfactory performance of all assigned duties. Refer to the Annual Program of Study Review for Doctoral Students section in the Handbook for further details on procedures for evaluation of satisfactory progress in the PhD program of study.

Fellowships and Scholarships

The Graduate School, in cooperation with the College and Department, administers several different kinds of financial aid. To qualify for any of these, the graduate student must be admitted to the Graduate School and be defined as a full-time graduate student (i.e., enrolled for 6-9 hours of course work or certified by the department as working full-time on the master's thesis or doctoral dissertation). Visit the following website for greater details on these financial awards at: <http://www.temple.edu/grad/finances/index.htm>

The following competitive fellowships are available only to doctoral candidates. Applications for these awards may be obtained from the Graduate School. **The application deadline is approximately February 1 of each year.**

Presidential Fellowships. These are the most prestigious awards offered by the Graduate School of Temple University. They are awarded to unique and exceptional students. Each Presidential Fellowship carries a 12-month stipend and full tuition remission.

University and Future Faculty Fellowships. These are available to outstanding incoming students and provide support as a 12-month period stipend and full tuition remission.

Loans and Work Study

Students interested in obtaining other kinds of financial aid should contact:

Student Financial Services

Ground Floor - Conwell Hall

1801 N. Broad Street

Philadelphia, PA. 19122

215.204.2244; Fax: 215.204.5897

sfs@temple.edu

<http://sfs.temple.edu/>

SECTION 8: NEUROMOTOR REHABILITATION AND VIRTUAL ENVIRONMENT (NERVE) LABS

NMS faculty and students are engaged in a breadth of research that takes place within the faculty research labs. NMS faculty engage in the Neuromotor Rehabilitation and Virtual Environment (NeRVE) Labs. The NeRVE research group is a state-of-the-art research facility consisting of laboratories investigating a range of basic and clinical issues in human sensorimotor neuroscience, including: upper extremity function, posture and gait, cerebral palsy, spinal cord function, concussion, sensorimotor integration, Mobile health (mHealth) applications, assistive device development. Virtual reality is an important component of several of these laboratories as a means to understand how sensory processing is integrated with motor function and to develop new rehabilitative techniques. There are currently multiple tenured/tenure-track scientists along with undergraduate/graduate students/postdoctoral fellows housed in a common space to promote interaction/discussion, providing a rich scientific atmosphere to share ideas through journal clubs and invited lectures. A brief description of the NeRVE labs and NMS faculty follow:

TRIBAL Lab, NMS Faculty

The Temple Research Immersive Balance and Locomotion (TRIBAL) Lab is a shared resource of all NMS faculty. The primary goal of the TRIBAL lab is to understand the neural and biomechanical basis of human balance and locomotion. Individuals stand or walk in a room-sized virtual reality cave that allows precise control of the visual surround along with input from vestibular, proprioceptive and tactile sensory systems. Balance control mechanisms can then be studied with regard to processes that fuse information from multiple sensory systems. Computational methods combine mechanisms of multisensory fusion with biomechanical investigations of multilink body dynamics to develop new techniques and “smart health technology” to improve mobility in patient populations with balance disorders including Parkinson’s disease, individuals with the loss of inner ear (vestibular) function, elderly individuals at risk of falling and athletes who have experienced concussion. Our multidisciplinary lab group, which includes physical therapists, kinesiologists, biomechanists, engineers and mathematicians, (and extreme sports enthusiasts) reflects the basic-to-applied range of problems we are investigating.

PHIRE Lab, Shiv Hiremath, PI

Personal Health Informatics and Rehabilitation Engineering (PHIRE) Laboratory focuses on studying health and physical activity patterns of people with disabilities in the community through wearable sensors and smartphone-based technologies. We develop and apply novel physical activity monitoring and feedback technology, which when combined with behavioral programs would improve the health and physical activity of people with disabilities. Focus Areas: Spinal Cord Injuries, Wearable Sensors

VEPO Lab, Emily Keshner, PI

The Virtual Environment and Postural Orientation Lab focuses on identifying how humans use visual cues to maintain balance and how the multimodal sensory inputs are processed and used for postural control. Current emphasis is on the control of balance in elderly adults and post-stroke patients. The lab uses virtual reality technology to provide a meaningful or unreliable visual environment and a dynamic posture platform with embedded force plates to produce physical instability. Motion analysis infrared cameras and electromyography are used to record changes in muscles and body motion.

MPAL, Richard Lauer, PI

The Movement Performance and Assessment Lab is a state of the art laboratory under the direction of Dr. Richard T. Lauer. Our research is focused on the development of novel assessments and interventions addressing the neuromuscular basis of balance and movement, such as movement and posture dysfunction, in adults and pediatrics. Applications include advanced signal processing techniques applied to biomechanics and electromyography data, use of accelerometers and motion capture system to quantify human movement in natural environments. Equipment includes a Trigno wireless EMG recording system, 7 laptops and personal computers tablets with MATLAB, a six-camera motion capture system.

NMCP, Jinsook Roh, PI

The Neuromotor Control and Plasticity Laboratory focuses on understanding the neural mechanisms of muscle coordination in the human upper extremity. The major equipment includes an isometric force measurement setup (a novel modification of Biodex system), the KINARM endpoint robot (a 2-D manipulandum robotic device; BKIN Technologies, Inc.), and 16-channel wireless electromyographic recording setup. Focus Areas: Human Motor Neuroscience, Neurorehabilitation following Neurological Disorders

Adaptations to Repetitive Motion and Stress (ARMS) Lab, Stephen Thomas, PI

Assistant Professor Thomas' research focuses on the adaptation of tissues to stress and overuse specifically at the shoulder. He has training in both basic science and applied research methods, which allow him to address clinically relevant questions with translation approaches thereby bridging the gap between bench and bedside. His current research agenda is two-fold and includes integration of translational research to investigate 1) the structural and biologic mechanisms governing soft tissue adaptation caused by the repetitive stress of throwing and the association with throwing biomechanics using novel diagnostic ultrasound methods, and 2) the structural, neuromuscular, and biologic adaptations occurring due to chronic rotator cuff tears and repairs.

SNM Lab, Chris Thompson, PI

The Spinal Neuromotor Laboratory houses equipment necessary for the non-invasive quantification of joint torques and single motor unit discharge patterns in humans with and without neurological injury. Our initial efforts require 6-degree of freedom load cells and custom frames for the isometric assessments of volitional and reflexive motor activity throughout the human body. Multiple computers are used to control robotic manipulandum and collect biological data. Large format displays provide real-time visual feedback of joint torques and allow for consistent assessments across multiple joints. A 384-channel amplifier is used in concert with multiple single channel amplifiers to record the electromyographic activity of the muscle. A high-performance computational cluster is used to decompose these data into the discharge of several tens individual spinal alpha motoneurons.

SC Lab, Ryan Tierney, PI

The mission of the Sport Concussion Laboratory is to broaden our understanding of brain injury. We conduct clinical research and, through collaboration with basic scientists, translational research connecting basic science and clinical practice. We are particularly interested in elucidating the mechanisms underlying variable cellular and clinical responses to mechanical stress imparted during concussive and sub-concussive head impacts. Our current research foci include: 1) Evaluating responses to sub-concussive head impacts using a controlled laboratory and field studies. 2) Evaluating diagnostic accuracy of state of the art concussion assessment techniques. 3) Evaluating factors that may result in variable responses to head impacts.

MAHO Lab, Carole Tucker, PI

The Movement Assessment and Health Outcomes Lab focuses on the use of technology to improve our understanding of health outcomes, Dr. Tucker direct the Child Health Outcomes Laboratory (MAHO) which is dedicated to the advancement of person centered health outcomes using modern measurement approaches, qualitative and psychometric expertise, and development of smart systems of wearable sensors for adaptive data collection. The laboratory provides support for psychometric and item bank development, qualitative and clinical validation, and technologies to support patient reported outcomes (PROs) in children who have difficulty with typical modes of self-report of health concepts. We have strong collaborative ties with The Childrens Hospital of

Philadelphia, the Shriners Hospitals for Children, and local parent and patient networks, as well as across academic departments at Temple University (TU) including the College of Engineering, Institute for Survey Research, Communication Sciences, and the Center for Data Analytics and Biomedical Informatics at TU. The laboratory has 3 computer workstations, 6 Microsoft bands, 2 Empatica embrace devices, Shimmer multi-sync sensor development platform, and 5 Actigraphs (wGT3X-BT) and Actilife software. Five tablets and an additional 2 Surface Android tablets are also available for use.

MAP Lab, Geoff Wright, PI

Motion-Action-Perception (MAP) Laboratory focuses on sensorimotor, perceptual, and psychological influences on human movement control, which include: neuromuscular processes, postural control, gait, and CNS disease models. The MAP lab employs advanced technology including virtual reality goggles (Oculus Rift DK2) and flatscreen television as well as exploring smart phone applications with the intent of finding portable and economically accessible innovations for investigating the human nervous system. The lab is also equipped with a motion capture (Motion Analysis Systems), electro-oculography (BlueGain, SMI), Neurocom Smart Balance Manager, and electromyography equipment (Delsys Trigno, Noraxon, Biometrics). Clinical populations such as Parkinson's Disease, TBI, PTSD, and various sensorimotor disorders are some of the disease models that are investigated.

SECTION 9: NMS PROGRAM FORMS

- 1. Individualized Development Plan**
- 2. Independent Study Contract**
- 3. Laboratory Rotation/ Research Experience Contract**
- 4. Plan of Study – MS**
- 5. Plan of Study – PhD**

Neuromotor Science Individualized Development Plan (IDP)

Annual Progress Meeting Template

Please complete this form electronically and email to the Graduate Program Director by October 1st of your current academic year. Complete the form as a Word document, with all required signatures. Rename the filename to "your name progress AY XXXX" before emailing it.

The following template provides some guiding questions that can facilitate an annual career progress and mentoring meeting between the postdoc and his/her faculty mentor(s).

Students: complete Parts I to III and attach your updated CV. Provide both documents to your faculty mentor(s) in advance of scheduling your meeting.

Faculty Advisors & Mentor(s): discuss Parts I to III, review goals and objectives and think of action steps towards progress. Discuss with your mentor(s) and complete Part IV together: outlining action steps and activities you agree to do towards making progress and meeting stated goals and objectives.

Individualized Development Plan (IDP)Resources

<http://myidp.sciencecareers.org/>

<http://www.faseb.org/Policy-and-Government-Affairs/Science-Policy-Issues/Training-and-Career-Opportunities-for-Scientists/Individual-Development-Plan.aspx>

Student Name _____

Year in Program (as of current Fall semester): _____

Signature of Student _____ Date _____

Name Advisor _____

Signature of Advisor _____ Date _____

(Electronic signatures are acceptable)

Signature of Program Director _____

Date _____

4 Copies: 1 student's permanent record
 1 Program Director

1 supervising faculty member
1 student

Financial Support:

Indicate the source (RA, TA, Fellowship) of your financial support for Summer 20XX, Fall 20XX, and Spring 20XX.

Semester	Source

Current Academic Year (Summer 20XX- Spring 20XX)

Indicate the anticipated source of your financial support for the coming year.

Semester	Source

Coursework:

In chronological order, list all courses you have taken for all years you have been in the NMS program. Indicate semester, course code, course name, and grade. Also list all anticipated courses that are remaining to complete (include anticipated semester). It is important that you are cognizant of the Graduate School policy regarding acceptable grades. It states that a graduate student may earn no more than two grades of less than B- quality, may receive no more than one grade of F, must have at least a 3.0 GPA at graduation, and may not graduate with an outstanding incomplete (I) grade. Details of this Policy are described in section 02.24 of the Graduate School Policies and can be viewed at the following website:

<http://www.temple.edu/grad/policies/gradpolicies.htm#GCSS24>

Failure to meet grade and progress standards may result in dismissal from the NMS program. See section on Dismissal from Graduate Programs in the Graduate Handbook for further details.

Part I. Overall progress: Review of the last year

1. Highlight your major **accomplishments** in the past year (e.g., **publications**, patents, honors or awards, grants or fellowships)
2. Brief overview of research **progress** in the past year:
3. List any **Published and Submitted Scholarly Work including journals, status**
4. List any **presentations** at professional meetings or conferences both internal and outside of Temple

5. **Experiential Training:** What seminars, conferences, lab meetings, etc. do you participate in? Are they meeting your needs? If not, what else would be helpful?

6. **Awards or Honors Received:**

7. **External Grant Applications Submitted – include funder, amount, review dates**

8. **Teaching Activities:**

In chronological order, list all courses you have taught or served as a teaching assistant since you have been in the NMS PhD program. List semester, course code, and course name.

How much, in percent effort? Is this sufficient for developing multidisciplinary academic skills? In what ways could these activities be interfering with research productivity?

9. **Administrative and Other Duties**, such as assistance with writing grants or mentoring graduate or undergraduate students: How much, in percent effort? Are these activities relevant to your development of academic or professional skills? In what ways could these activities be interfering with your research productivity?

10. Did you accomplish all that you agreed on doing with your mentor under the **Action Plan** during your initial meeting?
If no, what parts of the plan did you not accomplish and why? Describe/list any unusual or unanticipated **challenges** you experienced.

11. **Mentoring** and Professional Collaborations:

a. How often did you meet with your faculty advisor/mentor(s) last year?

How would you rank the frequency of meetings? Too few Just right Too many

b. Who are your secondary mentors? Is that person a faculty member? How often did you meet with them?

c. Do you have collaborators outside of the lab? Please list their names and roles.

Part II. Wellbeing:

a. Research environment: What features of the lab group or your relationships with colleagues and collaborators are most helpful and supportive to your wellbeing? What concerns could negatively affect your progress?

b. Work-life balance: What do you do to maintain a balance between your work and life/personal needs? What would you like to continue to do, or do differently next year?

c. Do stresses or concerns exist in your personal life that could impact your work? How are things going generally? Are you able to take regular breaks and vacations?

Part III. Goals and Objectives:

1. Refer to your previous discussion with your faculty mentor(s). What changes or modifications took place?
2. **List up to 5 scientific and career objectives in the coming year.**
3. What **opportunities** at Temple and beyond can assist you in reaching your professional/non-scientific objectives? For example, participation in meetings, courses or workshop attendance (identify meeting/workshop and date)?

To be developed jointly by the student and the mentor(s) during or after the discussion

Part IV. Action Plan for Your Next Steps. In carrying out activities that may assist you in meeting your Research/Scientific objectives listed above--

1. Projected timeline for completing your current projects and degree
2. Projected timeline for your job search
3. List the **activities** in which you and your mentor(s) agree you should participate that will support you in achieving your scientific and professional objectives in the coming year.
4. What additional actions can you and your mentor continue to do, in order to help you be successful?

Completion of Preliminary Examination Requirement:

Anticipated date for completion: _____

Completion date: _____

COMPLETE THE FOLLOWING ONLY IF YOU HAVE ADVANCED TO PhD CANDIDACY (post-proposal completion)

Dissertation Research:

- (1) General research topic:
- (2) Summary of progress (paragraph describing progress in the last year):
- (3) Anticipated date of dissertation defense:



College of Public Health

**Neuromotor Science Program
Contract for Independent Study Courses
NMS 9682**

Students who wish to undertake the independent study courses are **required to have the advance written approval of their advisor and Program Director**. To register, you must present this completed registration form with attachments, signed by your advisor and the faculty member who will supervise and grade the work, to the Program Director. The Independent Study form should be submitted for signatures at the time of registration, but no later than the last day of classes the semester before the Independent Study will occur.

The scope of work should reflect a single semester's amount of work and not be designed to require an Incomplete grade. Please see the Graduate School policies for timely completion of coursework and Incompletes.

Attach the following:

- 1-page time-line showing target dates for completing key elements of the independent work and that it will be completed within the semester.
- Any additional attachments.

Student's Name: _____ **Date:** _____

Course Number: _____ **Credits:** _____

Semester: _____ **Year:** _____

Faculty Member(s) Supervising and Grading Work: _____

Any other Faculty member(s) who will supervise/grade work _____

Rationale for undertaking Independent Work:

Primary Objectives of Independent Work:

Competencies Addressed in Independent Work:

How will the work be evaluated and graded?

(Include letter grade or Pass/Fail and the products or activities to be evaluated and graded)

Signatures Required:

Student's Signature: _____ **Date** _____

Supervising Faculty Member: _____ **Date** _____

Program Director: _____ **Date** _____

4 Copies: 1 student's permanent record 1 supervising faculty member
 1 Program Director 1 student



College of Public Health

**Neuromotor Science Program
Contract for Research Experiences or
Laboratory Rotation NMS 9654**

Course Title: Laboratory Rotation/Seminar in Neuromotor Science

Course Description:

The student will have an opportunity to gain specific research laboratory skills under close faculty mentorship. Each laboratory experience will be custom designed by the faculty member for each student depending on the faculty/student research interests. For example, a lab rotation might include learning instrumentation setup, reducing data, preparing research results for professional presentations, library work, visiting other research labs, etc.

1. State the specific project or portion of a project to be completed during the Laboratory Rotation.
2. List the specific objectives and related tasks to be completed that will support the specific project to be completed. The focus should be on what skills the student will be learning.
3. State how the Laboratory Rotation will be evaluated including who will evaluate what objectives/tasks and for what percentage of the grade. A self-evaluation by the student must be part of the final grade.
4. A copy of the Laboratory Rotation will be placed in the student's academic file by the Program Director.

Students who wish to undertake the laboratory courses are **required to have the advance written approval of their advisor and Program Director**. To register, you must present this completed registration form with attachments, signed by your advisor and the faculty member who will supervise and grade the work, to the Program Director. This form should be submitted for signatures at the time of registration, but no later than the last day of classes the semester before the Independent Study will occur.

The scope of work should reflect a single semester's amount of work and not be designed to require an Incomplete grade. Please see the Graduate School policies for timely completion of coursework and Incompletes.

Student's Name: _____ **Date:** _____

Semester: _____ **Year:** _____

Faculty Member(s) Supervising and Grading Work: _____

Any other Faculty member(s) or personnel who will supervise/grade work _____

Objectives:

5. State the specific project or portion of a project to be completed during the Laboratory Rotation. Note that seminar attendance is a part of this course experience.
6. List the specific objectives and related tasks to be completed that will support the specific project to be completed. The focus should be on what skills the student will be learning.
7. State how the Laboratory Rotation will be evaluated including who will evaluate what objectives/tasks and for what percentage of the grade. A self-evaluation by the student must be part of the final grade.
8. A copy of the Laboratory Rotation will be placed in the student's academic file by the faculty sponsor.

Brief description of project student will complete (< 250 words)

Complete the following table

Objective	Activities	Products/Deliverables
Participate in scholarly discussions	Graduate Seminars & Journal Clubs	Participation in 3 or more seminars
Understand the main questions and methods underlying the specific field of study	Literature review	Summary of literature review, Annotated Bibliography
Competency in Lab Procedures		
Pilot data collection		
Analyses & interpretation of data		
Student self-assessment		

Method of Evaluation;

1. Participation – ?%
2. Annotated Bibliography – ?%
3. Competency in laboratory procedures – ?%
4. Pilot data collection – ?%
5. Analyses & interpretation of data – ?%
6. Student self-assessment – ?%

Signatures Required:

Student's Signature: _____

Date _____

Supervising Faculty Member: _____

Date _____

Program Director: _____

Date _____

4 Copies: 1 student's permanent record
1 Program Director

1 supervising faculty member
1 student

MS Program in Neuromotor Science – Semester Progress Tracking Form

Name: _____

TUID _____

Date: _____

MS Program in Neuromotor Science (30 CH Total)		CH	Gr	Sem	Notes
CPH Required (0 CH)					
HPRP 5001	Public Health Modules	0			
Core Courses (15 CH)					
NMS 9621	Neuromotor Science 1: Neural Factors	3			
NMS 9624	Neuromotor Science 2: Mechanics & Models	3			
NMS 9627	Neuromotor Science 3: Cognition & Learning	3			
NMS 9623	Neuromotor Science: Programming	3			
NMS 9622	Neuromotor Science: Instrumentation	3			
Research Design & Statistics (3 CH)					
Stats/ Res Design 1		3			PBHL5002 Biostats recommended
Research Experiences (3 CH)					
NMS 9654	Laboratory Rotation and Seminar 1	3			
Electives (9 CH)		9			
Total CH		30			

Reviewed by: _____ Student: _____

PhD Program in Neuromotor Science – Semester Progress Tracking Form

Name: _____

TUID _____

Date: _____

PhD Program in Neuromotor Science (45 CH Total)		CH	Gr	Sem	Notes
Required Courses (33 CH) Course Number (SH) Course Title					
Core Courses (18 CH)					
NMS 9621	Neuromotor Science 1: Neural Factors	3			
NMS 9624	Neuromotor Science 2: Mechanics & Models	3			
NMS 9627	Neuromotor Science 3: Cognition & Learning	3			
NMS 9623	Neuromotor Science: Programming	3			
NMS 9622	Neuromotor Science: Instrumentation	3			
NMS 9653	Grantsmanship	3			
Public Health (0 CH)					
(0 CH)	Public Health (self-learning module)				
Research Design & Statistics (9 CH)					
PBHL 5002	Biostatistics	3			
EPSY 8826	Multivar Res Methods	3			
		3			
Research Experience (0 CH)					
	Research Experiences	0			
	Research Experiences	0			
Electives (12 SH)		12			
Other					
Dissertation Related (6 SH)					
NMS 9994	Qualifying Examination	1			
	Qualifying Examination (Science)				
NMS 9998	Dissertation Proposal	2			
NMS 9999	Dissertation Research	3			

- Can substitute PBHL 5500 Sem in Curr Iss- Pub Hlth - Grantsmanship

Reviewed by: _____ Student: _____