Double Degree Track in Neuroscience & International Public Policy at the University of Wisconsin-Madison

**Purpose:** The Neuroscience and Public Policy Program offers a double degree track that leads to the Ph.D. degree in neuroscience, which is granted by the Neuroscience Training Program, and a Master of International Public Affairs (M.I.P.A.) degree that focuses on international science and technology policy, which is awarded by the La Follette School of Public Affairs. This double degree track will educate neuroscientists who wish to be involved in helping to shape international public policy as it relates to issues in developing countries and other foreign societies that can be addressed by applying knowledge gained from discovery in neuroscience.

**Rationale:** Advances in neuroscience research already have raised important questions for a wide range of issues in international public policy. Among them are included: child development, welfare, and education, health care delivery and management, mental health status, the safety and efficacy of pharmaceuticals or medical devices, and environmental risk factors. To effectively address these and other issues, there is a clear need for scientists who have been trained to think critically about neuroscience as well as the making of international public policy, and who have appropriate skills and experience to create an effective integration of the two areas. The double degree track in neuroscience and international public policy trains students specifically in the skills needed to take results from research in neuroscience and use them to develop public policy applicable to international issues. The acquisition of such skills is consistent, for example, with the goals of the UW Initiative for Global Health.

**Focal Areas:** The overlap between neuroscience and international public policy is broad, encompassing a wide range of important issues that can be informed by different areas of neuroscience. Allowing for country to country differences with respect to policy priorities, some of the potential focal areas for international work under the Neuroscience and M.I.P.A. double degree track include:

- Neuroscience and human development: nutrition, blindness and disease in early childhood development in poor and developing countries
- Neurotoxins: neurotoxin risk and environmental exposure, including special populations such as fetuses; use of neurotoxins in warfare and police actions
- Neuroscience and behavior: social behavior and policy for creating stable societies, policies for reducing violent behavior, suicide, and addiction.
- Neuroscience and education: early childhood, adolescent, and adult brain growth and development
- Neuroscience and law: neurobiological basis for decision making by those who are addicted, mentally impaired, or presumably normal
- Brain function and policy: determining brain death, the mental capacity of adolescents and mental health patients to stand trial, drug and alcohol use and impairment of mental capacity and its effects on socialization, especially in developing countries.
- Brain interventions: emerging imaging techniques, pharmaceuticals for behavioral modification, genetic or stem cell therapies, neuro-mechanical interfaces, nano-biotechnologies

**Enrollment and Training:** The normal path for students in the Neuroscience and M.I.P.A. double degree track will be to enter the M.I.P.A. program and the Ph.D. program in Neuroscience simultaneously in year one. For most students, the M.I.P.A. program will be completed in three years, the Ph.D. program in three to four additional years. For students who wish to start in the M.I.P.A. program after already having begun in the Neuroscience program, a case-by-case evaluation will be made, in consultation with the student and her/his advisor, about how best to integrate the student's training in the two programs.
Applications: Applications for admission to the Neuroscience and M.I.P.A. track will be due on December 1, the same due date as applications to the Neuroscience Training Program, and close to the due date (January 1) for applications to the La Follette School. The admissions committees of the Neuroscience Training Program, the La Follette School and the Neuroscience and Public Policy Program will review applicants to the double degree track as part of the admissions process. Students must be admitted by the Neuroscience Training Program, the La Follette School and the Neuroscience and Public Policy Program to enroll in the Neuroscience and M.I.P.A. track.

Student Support: Students in the Neuroscience and M.I.P.A. track will be supported by funds from the training grants held by the Neuroscience Training Program and the Neuroscience and Public Policy Program, or by teaching or research assistantships. All students in the Neuroscience and M.I.P.A. double degree track will be required to apply for Federal and foundation predoctoral fellowships.

Typical Timetable for a Student in the Neuroscience and M.I.P.A. Double Degree Track

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<tr>
<th>Year</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Years 5-7</th>
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<tr>
<td><strong>Fall Semester</strong></td>
<td><strong>Public Affr 818 (3)</strong></td>
<td><strong>Public Affr 850 (3)</strong></td>
<td><strong>M.I.P.A. Elective (3)</strong></td>
<td><strong>Neurosci Sem (1)</strong></td>
<td><strong>Neurosci Sem (1)</strong></td>
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<td>Neurosci 610 (4)</td>
<td>Neurosci 880 (3)</td>
<td>M.I.P.A. Elective (3)**</td>
<td>Neurosci &amp; Public Policy Sem (1)***</td>
<td>Neurosci &amp; Public Policy Sem (1)</td>
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<td>Prof Dev 700 (1)</td>
<td>M.I.P.A. Elective (3)**</td>
<td>Midlevel elective: Cell/Mol/Dev (3)</td>
<td>Complete Ph.D. Preliminary Examination</td>
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<td>Neurosci Sem (1)</td>
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<td>One Lab Rotation Research (2)</td>
<td>Research (1)</td>
<td>Research (3)</td>
<td>Research (10)</td>
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<td>Research (1)</td>
<td>Research (3)</td>
<td>Research (1)</td>
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<td><strong>Spring Semester</strong></td>
<td><strong>Public Affr 819 (3)</strong> or BMI 576 (3)**</td>
<td><strong>Public Affr 854 (3)</strong></td>
<td><strong>Public Affr 860 (3)</strong></td>
<td><strong>Neurosci Sem (1)</strong></td>
<td><strong>Neurosci Sem (1)</strong></td>
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<td>Neurosci Sem (1)</td>
<td>Neurosci Sem (1)</td>
<td>Neurosci Sem (1)</td>
<td>Complete Ph.D. Thesis</td>
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<td>Neurosci &amp; Public Policy Sem (1)***</td>
<td>Neurosci &amp; Public Policy Sem (1)***</td>
<td>Neurosci &amp; Public Policy Sem (1)***</td>
<td>Defend Ph.D Thesis</td>
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<td>Two Lab Rotations</td>
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<td>Two Lab Rotations</td>
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<td>Select Ph.D. Thesis Committee</td>
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<td>Research (3)</td>
<td>Research (4)</td>
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<td>Research (3)</td>
<td>Research (4)</td>
<td>Research (1)</td>
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<tr>
<td><strong>Summer</strong></td>
<td>Begin research in Thesis Lab</td>
<td>Public Policy Internship (3)</td>
<td>Complete M.I.P.A. Degree Requirements</td>
<td>Research (3)</td>
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Numbers in parentheses indicate credits. * Students select from a list of courses currently offered in the area of science and technology policy. ** Students select from a list of courses currently offered in the area of law, ethics, and biology. *** This course, described below, leads to the preparation of a major research paper in neuroscience and public policy that is submitted at the end of the third academic year. Students are required to take the Neuroscience and Public Policy Seminar during each of the semesters that they are enrolled in the Neuroscience and Public Policy Program. Four Seminar credits may be counted toward the M.I.P.A. degree requirements. + The sequence of some of the courses in the second and third years is flexible depending upon the availability of specific courses and scheduling of neuroscience research obligations.

Requirements for the Double Degree:

**Ph.D. Degree in Neuroscience**

Since its inception, the Neuroscience Training Program has made a special effort to avoid formulaic graduate training and instead respond to the needs of individual students. Indeed, this is one of the Program's core values, and, therefore, the Program is very well suited to be flexible in accommodating the special challenges that double degree students must meet.
**Required Courses (8 cr)**

*Neuroscience 610/611 (8 cr).* A two-semester sequence in neurobiology. These two courses provide students with an introduction to the nervous system, from cells and molecules to brain and behavior.

**Additional Courses (4-6 cr)**

Students also take two mid-level electives, one in cellular, molecular, and developmental neurobiology, and one in systems or behavioral neurobiology. These electives will be selected in consultation with the student’s thesis advisor and committee.

**Additional Requirements**

- Students will select a thesis advisor and advisory committee by the end of the First Year.
- The thesis advisory committee will include faculty from neuroscience and from public policy.
- Students complete three lab rotations during the First Year, although the timing and duration of each rotation may be adjusted to accommodate the requirements of the double degree.
- The Public Policy Internship (see below) will substitute for the neuroscience teaching requirement.
- Students attend the weekly Neuroscience Seminar and present Neuroscience Seminar Sub-Group talks according to the established schedule for presentation.
- Students complete a Ph.D. Preliminary Examination. Normally, this will be taken during the summer after the third academic year, although the examination may be delayed into the first semester of the fourth year if necessary. The Preliminary Examination consists of an oral defense before the student’s advisory committee of the Neuroscience and International Public Policy research paper (see below) and a doctoral thesis proposal.
- Complete thesis research and doctoral defense. For most students, the defense will be presented before the end of the 6th or 7th year in the Program.

**Master of International Public Affairs Degree**

The La Follette School's M.I.P.A. degree program, which will be completed in three years of study, is organized around a curriculum of 42 credits, of which 18 credits are required core courses and 24 credits are electives. The program is explicitly designed to be flexible, enabling students to fulfill a substantial number of the required electives with courses offered throughout the university that are specifically relevant to their future career interests. The M.I.P.A. program is conducive to accommodating the academic challenges that are involved in earning double degrees.

**Required Courses for the M.I.P.A. Degree (18 cr)**

- *International Governance 850* provides the broad substantive framework for the study of public affairs in the context of globalization. It identifies and explores major international policy issues and policy context, with an analytical emphasis on domestic and international public, private, and non-governmental influences in governance.
- *Introduction to Quantitative Methods for Public Policy Analysis 818* offers an introduction to statistical methods used in public policy.
- *Macroeconomic Policy Analysis and International Financial Regulation 854.* This course surveys international macroeconomics, with special reference to international monetary policy and international financial market architecture. The aim of this course is to provide an analytical background for those who plan to go into government service, international organizations and agencies, businesses involved in the global economy, nongovernmental organizations with international foci, and consulting firms analyzing international policy issues.
- *Microeconomic Policy Analysis 880* develops competence in important analytic tools for the study of international public affairs. Students learn how to assess policy responses to macroeconomic
events, evaluate implications of policies for efficiency and equity, and employ basic statistical methods to interpret and present quantitative data relevant to policy considerations.

- **Introduction to Policy Analysis 873.** This class provides basic concepts and analytical frameworks to understand policy problems, including an understanding of the rationales for government intervention, and the capacity to identify policy goals and assess competing policy alternatives.

- **Workshop in Public Affairs, International Issues 860.** The M.I.P.A. capstone course, gives students practical experience working in teams and applying the conceptual and analytical tools acquired during three semesters of coursework to real-world international issues clients face in the public, private, and non-governmental sectors. Workshop clients have included the Organization for Economic Co-operation and Development in Paris, the British Embassy in Washington, D.C., the International Land Coalition in Rome, and a non-governmental university in Bangladesh.

**Advanced Elective Courses for the M.I.P.A. Degree (24 cr)**

Students will earn 24 elective credits by enrolling in courses such as those listed below.

- **Quantitative Methods 819 or Biomedical Informatics 576 (3 cr).** Surveys methods of empirical analysis used to support policy analysis and public decision making, emphasizing applied multivariate regression analysis. This course is designed to equip students with fundamental skills for conducting quantitative analyses of public policy problems, and interpreting the published research of other analysts and scholars. While this course is not required, it is strongly recommended.

- **Introduction to Public Management, 878 (3 cr).** The goals of this course are to: deepen appreciation of the importance of public management in a democratic scheme of governance; enhance the ability to think analytically about problems of public management; and improve skills needed to make good arguments concerning how public management issues.

- **Political Economy of Corruption and Good Governance 857 (3 cr).** This course considers issues of definition and measurement and then examines a number of theoretical perspectives on causes and consequences of corruption, mainly from the disciplines of political science and economics, and explores the state of cumulative knowledge on corruption as a policy issue that demands action both within countries and globally by a wide range of players.

- **Trade, Competition and Governance in a Global Economy, 856 (3 cr.** International trade, theories, rules, institutions and major policy issues facing the global trading system are among the topics that will be covered.

- **Global Environmental Governance, 866 (3 cr).** The breadth of environmental problems at stake and the history of attempts to solve them will be discussed. Basic frameworks, institutions, and actors will be covered, and four weeks will be spent studying a prominent contemporary international environmental issue, climate change.

- **Government Finance in Developing Countries, 867 (3 cr).** This course examines the changing structures and operations of government fiscal systems in developing countries, with particular emphasis on the growing trend to strengthen sub-national governments.

- **Science & Technology Policy Elective (3 cr):** Students will select from a list of graduate-level courses in science and technology policy that provide conceptual frameworks and analytical tools for understanding the politics of science and technology, including: debates about the role of science and expertise in public policy, evolving rationales for public support of scientific and technological research, and political controversies about emerging technologies. Several appropriate courses are offered by the La Follette School an, Political Science, Sociology, and other fields.

- **Bioethics/Law and Science Elective (3 cr).** Students would select from a list of graduate-level
courses on bioethics and law, science, and technology taught in the Law School and the Department of Medical History and Bioethics.

- **Public Policy Internship** (3 cr). Students pursue a summer internship working in the public policy sector (for, e.g., a state or federal government agency, advocacy organization, science funding agency, patient organization, scientific professional organization, etc.
- **Neuroscience 610/611** (8 cr). Students in the double degree track will be allowed to count their two core neuroscience courses (610/611) as electives.
- **Neuroscience and Public Policy Seminar** (1 cr each semester. Four credits may be applied toward the M.I.P.A. degree.). Students enroll in the Neuroscience and Public Policy Seminar during each of the semesters that they are enrolled in the Neuroscience and Neuroscience and Public Policy Program.

**Neuroscience and Public Policy Seminar, Neuroscience 660:** The Neuroscience and Public Policy Seminar serves as the focal point for connecting a student’s training in neuroscience and public policy, and it provides intellectual continuity between the two fields throughout the entire period of enrollment in the Neuroscience and Public Policy Program. The Seminar meets twice monthly during each semester, in a format that consists of an invited speaker, discussion sections, required readings and succinct written critiques of the lectures presented in the Seminar. The Seminar serves students in the Neuroscience and Public Policy Program, and is open to other qualified students as well.

**Neuroscience and International Public Policy Research Paper:** Following the first six semesters in the Neuroscience and Public Policy Program, students in the Neuroscience and M.I.P.A. track prepare a comprehensive research paper on a topic that bridges neuroscience and international public policy. The paper is presented to the student's thesis advisory committee. Students select a bridging topic with the advice of their thesis committee, carry out an appropriate literature review, and defend the paper in an oral examination before the committee. Successful completion of the research paper and its defense before the advisory committee will fulfill half of the Preliminary Examination requirements for the Ph.D. degree in neuroscience.

**Public Policy Internship:** Neuroscience and M.I.P.A. double degree track students pursue a three month summer internship, at the end of the third academic year, working in an area of science and international public policy (e.g., in a state or federal government agency, advocacy organization, science funding agency, or scientific professional organization, etc.). Internships must be approved by the Program's Steering Committee before they are begun.

**Preparation for Postgraduate Training:** Students who complete the M.I.P.A.\Ph.D. double degree track will be excellent candidates for a range of policy-oriented training and fellowship programs, such as those offered by AAAS, the National Academy of Sciences, the State Department and other institutions, which are designed to bring scientists to Washington, DC, for one to two-year periods of time. Double degree students also will be prepared to pursue postdoctoral research opportunities in academia in both science and technology policy and neuroscience.

**Career Opportunities:** The Neuroscience and M.I.P.A. double degree track responds to a growing need in academia, government, and the private sector for neuroscientists with strong research skills to tackle growing volume of issues in international public policy. Albert Teich, the Director of Science & Policy Programs for AAAS, estimates that, in the US alone, “this probably represents a universe of several hundred positions over the next couple of decades” that might be filled by graduates of the Neuroscience and Public Policy Program. Outside the US, he believes we may see many more. In addition, he believes
graduates of the double degree Program would be outstanding candidates for the AAAS fellowship programs, before proceeding to build their careers.

**Academic Positions:** Departments in the biological sciences, international studies, and schools of public policy are increasingly recognizing the importance of hiring faculty who can link the biological sciences and international science and technology policy. In recent years, UCLA has established a Program in Genetics and Society and Duke University has created an Institute for Genome Sciences and Policy. Faculty who are trained in neuroscience and international public policy will be well equipped to help universities grapple with the growing range of challenges to in international research policy and regulation, including, biological and chemical safety, the creation and disposal of materials hazardous to the nervous system, global pollution, and bioterrorism, etc. Such faculty will be valuable members of biological sciences departments or departments of international and/or area studies, should they choose to pursue these issues on a full-time basis. It is anticipated that the majority of the graduates of the Neuroscience and International Public Affairs double degree track will elect an academic career in neuroscience that provides ample time for research as well as time for involvement in international public policy issues, just as graduates of M.D./Ph.D. programs accept academic positions combining basic research and clinical medicine.

**Government Positions:** Two career tracks have emerged in government for students with strong technical and international policy skills. One is in the area of research management. Currently, a range of federal agencies, including the National Institutes of Health (Fogarty International Center), National Science Foundation (Office of International Science and Engineering), White House Office of Science and Technology Policy (Global Science Diplomacy), Centers for Disease Control (Global Health), Department of Health and Human Services (Global Health.Gov), Defense Department (International Science and Technology) State Department (Office of Science and Technology Advisor), and others, employ biological scientists in research management, program management (including the management of funding programs), and leadership positions.

Over the next decade, we also anticipate that federal agencies, Congress, and foreign governments will increasingly be challenged to consider new laws and regulatory systems governing the international use of a range of new biological technologies. Already, debates have begun to surround technologies such as genetic engineering, brain imaging and stem cells. As these debates expand and acquire political significance, scientific leaders with skills that bridge the biological sciences and international policy analysis will be called upon to fill positions on legislative staffs, at private-sector think tanks and consulting organizations, at regulatory agencies, and at scientific institutions such as the National Academy of Sciences, National Research Council, and National Institute of Medicine.

**Private Sector Positions:** In addition to opportunities in academia and government, corporations and other private sector entities, such as think tanks, consulting organizations and foundations, can be expected to increase their hiring of students with scientific and policy training. For example, a major trend in government has been the outsourcing of technical policy analysis to consulting firms. As the implications for societies worldwide of discovery in neuroscience and other biological science continues to expand rapidly, the need for sound policy analysis will grow correspondingly, and many private sector consulting firms can be expected to increase their hiring of individuals who have been trained rigorously in neuroscience and international public policy.

**Administration:** The Neuroscience and Public Policy Program is administered by the director, who is assisted by two staff members, one each from the Neuroscience Training Program and the La Follette School, and a five-member, faculty steering committee, consisting of two faculty from the School of Medicine and Public Health, and one each from the College of Letters and Science, the La Follette School and the Law School.