**WashU Programs with sustainability learning outcomes**

The distinct headcount for students that graduated in academic year 2017 (SU2016, FL2016, SP2017) based on the programs highlighted on your list is 637. 4280 students graduated with degrees in AY 2017.

|  |  |  |
| --- | --- | --- |
| **graduates** | **ProgramCd** | **ProgramName** |
| 38 | AR0003 | B.S. IN ARCHITECTURE |
| 16 | AR0005 | BACHELOR OF DESIGN IN ARCHITECTURE |
| 8 | AR00M0 | MINOR IN ARCHITECTURE |
| 5 | AR00M1 | MINOR IN URBAN DESIGN |
| 4 | AR00M3 | MINOR IN LANDSCAPE ARCHITECTURE |
| 44 | GA0001 | MASTER OF ARCHITECTURE |
| 13 | GA0004 | MASTER OF URBAN DESIGN |
| 4 | GA0005 | MASTER OF LANDSCAPE ARCHITECTURE |
| 1 | GA0006 | MASTER OF LANDSCAPE ARCHITECTURE |
| 19 | GA0007 | MASTER OF ARCHITECTURE |
| 16 | GA0008 | MASTER OF ARCHITECTURE |
| 1 | GA0011 | MASTER OF SCIENCE IN ADVANCED ARCHITECTURAL DESIGN |
| 79 | GH0001 | MASTER OF PUBLIC HEALTH |
| 12 | GH00S1 | M.P.H. SPECIALIZATION IN GLOBAL HEALTH |
| 2 | GR1902 | A.M. IN EARTH & PLANETARY SCIENCES(WITHOUT THESIS) |
| 2 | GR1950 | PH.D. IN EARTH AND PLANETARY SCIENCES |
| 1 | LA1902 | A.B. MAJOR IN EARTH & PLANETARY SCIENCES: GEOLOGY |
| 11 | LA1905 | A.B. MAJOR IN ENVIRONMENTAL EARTH SCIENCES |
| 1 | LA19M1 | MINOR IN EARTH & PLANETARY SCIENCES |
| 1 | LA19M2 | MINOR IN ENVIRONMENTAL EARTH SCIENCES |
| 2 | LA19S5 | SECOND MAJOR IN ENVIRONMENTAL EARTH SCIENCES |
| 8 | LA3202 | A.B. MAJOR IN ENVIRONMENTAL POLICY |
| 3 | LA32S2 | SECOND MAJOR IN ENVIRONMENTAL POLICY |
| 47 | LA4802 | A.B. MAJOR IN ANTHROPOLOGY: GLOBAL HLTH ENVIRONMNT |
| 23 | LA48M2 | MINOR IN ANTHROPOLOGY: GLOBAL HLTH AND ENVIRONMENT |
| 6 | LA48S2 | SECOND MAJOR IN ANTHROPOLOGY: GLOBAL HLTH ENVIRON |
| 9 | LA82M1 | MINOR IN ENVIRONMENTAL STUDIES |
| 1 | UC1903 | B.S. IN SUSTAINABIITY: MANAGEMENT & ORGANIZATIONS |
| 1 | UC1904 | B.S. IN SUSTAINABILITY: COMMUNITIES & DEVELOPMENT |
| 5 | EN00M1 | MINOR IN ENVIRONMENTAL ENGINEERING SCIENCE |
| 6 | EN00M6 | MINOR IN ENERGY ENGINEERING |
| 8 | GR4102 | A.M. IN BIOLOGY (WITHOUT THESIS) |
| 11 | GR4112 | M.S. IN BIOLOGY |
| 6 | GR4185 | PH.D. IN BIOL/BIOMED SCI (EVOL, ECO & POPULATION) |
| 11 | GRE351 | PH.D. IN ENERGY, ENVIRONMENTAL AND CHEMICAL ENGR |
| 98 | LA4101 | A.B. MAJOR IN BIOLOGY |
| 1 | LA4103 | A.B. MAJOR IN BIOLOGY: ECOLOGY/EVOLUTION |
| 9 | LA4106 | A.B. MAJOR IN ENVIRONMENTAL BIOLOGY |
| 53 | LA41M1 | MINOR IN BIOLOGY |
| 16 | LA41S1 | SECOND MAJOR IN BIOLOGY |
| 10 | SI6316 | M.S. IN ENERGY, ENVIRONMENTAL AND CHEMICAL ENGR |
| 23 | SI6317 | MASTER OF ENGINEERING IN ENERGY, ENVIR AND CHEM EN |
| 2 | SW00S3 | M.S.W. SPECIALIZATION IN SOCIAL ENTREPRENEURSHIP |

**PROGRAM DETAILS**

**Sam Fox School of Art and Design - Curriculum Overview, BS and BA in Architecture**

Architecture is interdisciplinary in nature, drawing from various bases of knowledge and requiring collaboration with other fields. You'll find our program valuable for both its architectural focus and its broad-based nature. With multiple opportunities in the undergraduate curriculum to pursue study in other areas, our students develop abilities to think, communicate, and work across disciplinary lines.

The curriculum is centered around the design studio, where small groups of students and a faculty member work together on design projects that employ a "learn by doing" methodology. As an architecture student, you'll benefit from an intimate environment for learning; there are approximately 60 students in each incoming class, and studio class sizes are typically 15 or fewer students to one professor throughout your undergraduate program.

Throughout your four years, you will take both studio courses and Sam Fox School Commons courses that are offered by Art and Architecture and open to any student. These opportunities to study "in between" Art and Architecture expose you to different methods and ways of thinking, incorporating topics such as sustainability, public practice, and new technologies.

***Excerpts from curriculum overview:***

* Design studios focused on the relationship of architecture to the landscape and to the urban environment
* Interdisciplinary elective studies between art, architecture, and design
* Intensified design studios exploring building assemblies, structure, landscape, and sustainability
* Building systems course
* Architectural history and theory course work, with an emphasis on urban design issues
* Technology courses in environmental systems or landscape architecture

***Programs***

* BS/BA in Architecture: <http://www.samfoxschool.wustl.edu/node/4125>
* MA in Landscape architecture: <http://samfoxschool.wustl.edu/files/MLA3%20Curriculum%202.2.17.pdf>; http://samfoxschool.wustl.edu/files/MLA2%20Curriculum%202.2.17.pdf
* Minor in Landscape Architecture

**Brown School of Social Work**

***Programs:***

* Masters of Public Health (MPH)
* MPH specialization in global health
* MPH specialization in urban design
* Masters of Social Work, specialization in Social Entrepreneurship

MPH Foundational Knowledge (ie learning objectives) and Foundational Competencies that all MPH students must obtain (relevant excerpts):

* Explain effects of environmental factors on a population’s health.
* Explain how globalization affects global burdens of disease.
* Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health).

***Competencies Associated with the Specialization in Urban Design***

Students completing this specialization will be able to:

1. Understand, discuss, and contextualize public health and urban design history including important advancements, challenges, and theories at the nexus between the two.
2. Identify contemporary features of urban design that are associated with human health.
3. Explain how systematic differences in urban design across populations – such as access (i.e., presence and proximity), affordances, amenities, attributes, and accessibility (i.e., universal design and American with Disabilities Act) – contribute to health disparities.
4. Employ essential methodologies, including Geographic Information Systems and Health Impact Assessments, to enumerate and address current public health challenges and inequities associated with urban design.
5. Find, select, and apply appropriate evidence based programs and policies that support healthy environments and ameliorate urban inequalities.
6. Integrate current perspectives, evidence, and methodologies from a variety of academic and professional fields beyond the traditional boundaries of public health and urban design.

***MSW specialization in Social Entrepreneurship***

Required course: Social Entrepreneurship. Social entrepreneurship refers to the practice of combining innovation, resourcefulness and opportunity to address critical social and environmental challenges. Social entrepreneurs focus on transforming systems and practices to enable human potential and to create sustainable systems change. We will learn how social entrepreneurs have responded to social challenges through creating companies. What are the strengths and weaknesses of this approach compared to "traditional" non-profit management, activism, and social justice movements? Students will learn the basics of entrepreneurship, and work with selected student and community entrepreneurs on developing a business impact plan. Students who are interested in developing an existing minimum viable product (i.e. prototype of a viable idea) orproject in the class should contact the instructor in advance.However, if you are wanting to develop an idea and test if it is viable, you should consider the Social Innovation class (S50 SWSA 5063).The Social Entrepreneurship class is directed toward students who a) have a project that is past the idea stage (i.e. you have a Minimally Viable Product) or b) students who may not have their own idea/project but wish to work on a business impact plan in a team.The deliverable for this class is a business impact plan, the standard reporting document for Ashoka fellows.

**College of Arts & Sciences, Environmental Studies Program**

These goals apply to undergraduate students who participate in one of our associated environmental majors or interdisciplinary environmental minor as well as undergraduate and graduate students taking environmental studies electives. Our goal for these students is that they will possess the knowledge, critical thinking, communication, and analytical tools to design and evaluate solutions to real world environmental challenges through community engagement.

1. Foundational Knowledge

a. Understand key biological, geological, chemical, and physical processes that govern environmental processes and functioning

b. Understand the important political, economic, legal, social, and historic context related to environmental issues

2. Application

a. Be able to develop partnerships to address environmental issues

b. Articulate evidence-based opinions on environmental issues

c. Be able to effectively communicate orally and in writing across disciplinary lines and to a variety of audiences, specifically including possessing

i. Ability to articulate logical, cohesive, concise written arguments with appropriate structure for the target audience, including both technical documents and email communication

ii. Ability to communicate orally in both informal conversation and formal presentations

iii. Ability to communicate ideas, processes, functions, and relationships graphically

iv. Ability to communicate to diverse audiences including collaborators, scientists, clients, community partners, and lay public

d. Develop collaborative team work and project management skills

i. Ability to listen and to give and receive feedback

ii. Ability to identify tasks, set goals and milestones, delegate, execute, and monitor progress, and make flexible adjustments

3. Integration

a. Disciplinary grounding

i. Possessing a depth of knowledge and problem solving approaches within one’s discipline

ii. Recognizing disciplinary boundaries and limitations

b. Interdisciplinary competence

i. Ability to recognize perspectives, problem-solving approaches, and analytical tools of other disciplines

ii. Ability to identify and apply appropriate concepts and tools from disciplines relevant to the problem at hand

iii. Ability to navigate disciplinary language and meaning

iv. Ability to design and evaluate solutions to environmental challenges, specifically by integrating different disciplinary insights or problem solving approaches to produce understanding or product that is enriched by the integration

4. Human Dimension and Caring

a. Develop a sense of civic engagement and possess a desire to be engaged in one’s community

b. Understand and appreciate the role of environmental inequalities in society

5. Learning How To Learn

a. Be able to implement logical critical thinking processes such as scientific inquiry, problem-solving, decision-making, and design thinking

b. Ability to be a self-directed learner with the ability to tolerate the ambiguity, slow pace, and complexity of working on a complex, real-world problem

c. Possessing reflective behaviors, with the ability to reflect on the purpose, process, limitations, and quality of one’s work

***Programs*** ( https://admissions.wustl.edu/majors\_academics/majors\_programs/Pages/Environmental-Studies.aspx)

* Environmental Biology Major
* Environmental Earth Science Major
* Environmental Policy Major
* Environmental Studies Minor
* Interdisciplinary Environmental Analysis Minor

**Department of Energy, Environmental & Chemical Engineering:**

**Programs:**

* Minor in Environmental Engineering Science
* Minor in Energy Engineering

**Energy, Environmental and Chemical Engineering:** Chemical engineers are involved in the transfer of scientific discoveries to modern technologies and novel products that benefit society and minimize the impact on the environment. They deal with multiscale aspects of generating clean energy, producing novel and superior materials, and utilizing the biological revolution to manufacture new products. They are involved in the development and manufacture of consumer products, as well as in design, operation, and control of processes in a variety of industries (e.g., petroleum, petrochemical, chemical, consumer products, food, feed, pharmaceuticals). Their broad training in basic sciences (e.g., chemistry, physics, biology, mathematics) coupled with a strong foundation in chemical engineering principles (e.g., thermodynamics, mass and energy balances, transport phenomena, kinetics, separations, reaction engineering, control, product development, and process design) makes them invaluable team members and leaders in any engineering enterprise. It also prepares them well for graduate studies in biochemical, biomedical, chemical, environmental, and materials engineering. In addition, the B.S. degree in chemical engineering is a great starting point for pursing a degree in business, law, or medicine.

**Environmental Engineering Science Minor**: This 21 unit Environmental Engineering Science minor prepares students to seek an entry-level position as an environmental engineer, scientist or analyst. The minor also provides a solid foundation for undertaking graduate study in environmental engineering. Requires courses with outcomes specific to sustainability: Introduction to Energy, Environmental & Chemical Engineering, Green Engineering, Introduction to Ecology, Introduction to Soil Science, Environmental Geochemistry, Ecological Economics, Environmental Problem Solving, Environmental Policy, Interdisciplinary Environmental Clinic, Topics in Politics: Environmental Justice, topics in American Politics: Globalization, Urbanization & the Environment. https://eece.wustl.edu/undergraduate/programs/Documents/EnvEngrSci\_Minor\_2\_2017.pdf

**Energy Engineering Minor:** The 18 unit Energy Engineering minor gives students a broad coverage of courses in Energy Engineering. Students can also learn about other energy related research underway at Washington University, and participate in ongoing activities. Students will gain knowledge about the Clean Energy sector. Required courses and elective courses with sustainability learning outcomes/topics: Environmental Problem Solving, Environmental Policy, Energy and Buildings, Green Engineering, Sustainable Energy Environmental Building Systems, etc. https://eece.wustl.edu/undergraduate/programs/Documents/UG\_EnergyMinor\_1\_2017.pdf

**Department of Anthropology: Global Health and the Environment (Major and Minor)**

Requires courses that have sustainable learning outcomes: Introduction to Global Health, Culture and Environment (See list of relevant required course description for more details)

**Department of Biology**

Learning outcomes for all majors/minors from the biology department: A student graduating with a major in biology should be well educated in the history of scientific discovery in biology, the logical and statistical procedures used to formulate and to test biological hypotheses, and technical skills needed for conducting contemporary biological research. Majors should appreciate the hierarchical nature of biological complexity, and the major structures and functions emerging at the molecular, cellular, organismal, populational and ecosystem levels. At least one dimension of contemporary research should be understood in sufficient detail that the student could describe the major hypotheses currently being tested and demonstrate familiarity with techniques used to test those hypotheses. Mastery of the material will be evident in a student's ability to critique published data, identifying ambiguities and uncertainties in conclusions drawn from those data, and in understanding the societal importance of the research. A student attaining these goals will be prepared to make creative contributions to biology through independent research and/or teaching, and will be ready for graduate training in biological research, education, health care, industrial biotechnology, and the computational, legal and business careers related to biotechnology. A major should appreciate the importance of biological knowledge for solving societal problems. (<https://wubio.wustl.edu/undergraduate/major/mission-statement>)

**University College, BS in Sustainability with 3 areas of concentration**

**BS in Sustainability:** The Bachelor of Science in Sustainability provides an interdisciplinary approach to understanding and resolving today’s most pressing and complex environmental, economic, and social challenges. The program is built on a foundation of Arts & Sciences courses that examine sustainable living from multiple perspectives--scientific, political, economic, social, historical, philosophical, anthropological, and literary. Grounded in this integrative approach and common understanding of the issues, students then choose one of three concentrations for greater in-depth study of sustainability:

Three concentrations include selected courses from Arts & Sciences, Business, Engineering, and Architecture. The overarching goal of the Bachelor of Science in Sustainability is to provide students with knowledge and methods about sustainability, local to global, and to help improve the quality of individual lives, the productivity of institutions, and the security of our planet.

**Sustainable Environment and Science**, for primary focus on environmental sciences, natural resources, and energy; **Sustainable Management and Organizations**, for primary focus on sustainable business strategies and the triple bottom line—economic, social, environmental; **and Sustainable Communities and Development**, for primary focus on designing and managing sustainable spaces in our cities and communities.

**List of Required Courses**

Introduction to Global Health (required for Global Health and the Environment Major and Minor)

This course provides a general introduction to the multidisciplinary field of global health. We look at the roles that cultural anthropology, clinical medicine, and public health play in efforts to understand and ameliorate health problems around the world and in diverse settings. We explore the global burden and distribution of disease and mortality, the underlying determinants of health disparities and inequalities, the international development and role of policies and institutions, and the complex impacts and outcomes of medical and public health interventions. This course introduces students to important social theories in global health, delves into close-up case studies, and stresses the importance of how society and culture influence health and illness.

Culture and the Environment (required for Global Health and the Environment Major/Minor)

An introduction to the ecology of human culture, especially how "traditional" cultural ecosystems are organized and how they change with population density. Topics include foragers, extensive and intensive farming, industrial agriculture, the ecology of conflict, and problems in sustainability.

Environmental Problem Solving (required for Energy Engineering Minor and Environmental Engineering Science Minor)

This course aims to provide students with the opportunity to develop and apply problem-solving skills in the context of environmental challenges. Students will learn basic frameworks of decision-making through readings and role-play. Through the role-play students will grapple with the perspectives of multiple stakeholders, the interplay of science and policy, and the ambiguity and uncertainty inherent in decision-making processes.

Social Entrepreneurship (required for MSW specialization in social entrepreneurship): Social entrepreneurship refers to the practice of combining innovation, resourcefulness and opportunity to address critical social and environmental challenges. Social entrepreneurs focus on transforming systems and practices to enable human potential and to create sustainable systems change. We will learn how social entrepreneurs have responded to social challenges through creating companies. What are the strengths and weaknesses of this approach compared to "traditional" non-profit management, activism, and social justice movements? Students will learn the basics of entrepreneurship, and work with selected student and community entrepreneurs on developing a business impact plan. Students who are interested in developing an existing minimum viable product (i.e. prototype of a viable idea) orproject in the class should contact the instructor in advance.However, if you are wanting to develop an idea and test if it is viable, you should consider the Social Innovation class (S50 SWSA 5063).The Social Entrepreneurship class is directed toward students who a) have a project that is past the idea stage (i.e. you have a Minimally Viable Product) or b) students who may not have their own idea/project but wish to work on a business impact plan in a team.The deliverable for this class is a business impact plan, the standard reporting document for Ashoka fellows.