

**Global Experience Training (GET) Initiative**  
**Temple University Undergraduate Research Opportunities**  
*(June 19 - August 1, 2017)*

Temple School/College	Department	Faculty Supervisor	Project Title	Project Description	Required Skills	Hours per week	Course Requirement (if applicable)	Number of positions available
College of Engineering	Electrical and Computer Engineering	Joseph Picone	Machine Learning and Big Data	Develop a software system to automatically interpret biomedical signals such as EEGs and images such as pathology slides. See <a href="http://www.isip.piconepress.com">www.isip.piconepress.com</a> to learn more about our research group.	Requirements include significant programming experience with Python and/or C++, familiarity with the Linux operating system, a GPA above 3.0, and excellent English communications skills. Exposure to Signals and Systems and Statistics is preferred. Enrollment in 3 credit hours of independent study is required.	Full-time (40 hrs)	3-credit independent study	1
College of Science and Technology	Biology	Gianfranco Bellipanni	Wnt signaling in development and cancer	We use large array of genetic, biochemical and molecular biology techniques, in particular we use the CRISPR/Cas9 technology to precisely edit the genome of the zebrafish and modify genes of the Wnt pathway to understand, at molecular level the mechanism that control b-catenin nuclear localization in zebrafish embryo and cancer cells.	Requirements include basic knowledge of molecular biology and genetics, GPA above 3.0 and good English. Students will be involved in the screening of fish carrying the mutations we induce with the CRISPR/Cas9, they will be responsible of fish crossing, fish genotyping and phenotypes analysis of the mutants.	Full-time (40 hrs)	3-credit independent study	1
College of Science and Technology	Biology	Rob Kulathinal	The Institute of Genomics and Evolutionary Medicine (iGEM)	The Institute of Genomics and Evolutionary Medicine (iGEM) at Temple University is looking for exceptional international undergraduates for summer internship opportunities. Our world-renowned faculty advances research and product development across diverse biological disciplines from biomedicine to biodiversity. Research at iGEM primarily involves applying evolutionary computational approaches on genome-wide data sets. Please visit our website ( <a href="http://igem.temple.edu">igem.temple.edu</a> ) to explore the wide breadth of exciting research conducted by iGEM researchers.	Students should have previously taken course(s) in genetics, ii) be familiar with evolutionary tools and principles, and iii) able to quickly learn informatics (e.g., coding in R, python, etc.) as soon as they arrive, if not earlier.	30 hrs	2-credit independent study	6
College of Engineering	Electrical and Computer Engineering	Li Bai	ROS implementation of animated avatar using Javascript	We will need to develop a javascript client on a browser. The client is a javascript program which has ROS interface with other ROS nodes. The avatar will have the functionality like text to speech, speech recognition, face recognition and ability of processing multiple streams of sensor data using ROS protocols.	Requirements include Javascript, Python, GPA above 3.0 and good English. Some good graphic software skills will be a plus.	30 hrs	3-credit independent study	1
College of Engineering	Mechanical Engineering	Dmitriy Dikin	Exploring nanostructures: graphene-based functional materials	Graphene is one atom thick layer of carbon atoms and is a building block of graphite. It has many extraordinary properties (mechanical, physical, chemical, etc.) for constructing new type of functional materials. In our research we focus on the mechanisms of formation of three-dimensional (3D) highly porous structures from chemically modified two-dimensional (2D) graphene sheets, and on the methods of integration of this 3D architecture into high-performance nanostructured composite materials for practical applications in energy storage, catalysis, water treatment, and others. We invite enthusiastic individuals to join our interdisciplinary team and to contribute at all stages of research: routine lab work, performing measurements, data analysis, design and fabrication of certain components for experimental setups.	Students with major or minor in materials science, physics, inorganic chemistry, mechanical engineering are welcome to apply. However, the most important, we are looking for motivated, responsible, creative and well organized individuals.	30 hrs	3-credit independent study	1
College of Engineering	Mechanical Engineering	Haijun Liu	Fiber optic sensors for acoustic measurements	We will develop a sensor head on the tip of an optical fiber and use it to measure sound and determine sound source location. The undergraduate summer researcher will work with the faculty advisor to learn the fabrication process, how to build the fiber optic detection system, and use Labview for data acquisition.	Students with major or minor in physics or mechanical engineering are welcome to apply. However, the most important, we are looking for motivated, responsible, creative and well organized individuals.	30 hrs	3-credit independent study	1
College of Engineering	Bioengineering	Peter Lelkes	Immunohistochemistry of Wound Healing	Performing IHC to determine the extent of healing in tissues treated with wound healing dressings developed in our lab. Project will include histology, immunohistochemistry and microscopy.	wet lab experience preferred but a motivated student would be considered	30 hrs	3-credit independent study	1
College of Engineering	Bioengineering	Peter Lelkes	Electrospinning tissue engineering scaffolds	Using a technique called electrospinning to create 3 dimensional scaffolds for tissue engineering applications. Students will create scaffolds, characterize them with microscopy and mechanical tests and will culture them with cells to build a 3d construct	wet lab experience preferred but a motivated student would be considered	30 hrs	3-credit independent study	1
College of Engineering	Bioengineering	Peter Lelkes	Biomechanism of soy in wound healing	Soy has been shown to enhance wound healing in a number of animal models. Students will perform in vitro tests to determine the biomechanism by which soy enhances healing.	wet lab experience preferred but a motivated student would be considered	30 hrs	3-credit independent study	1
College of Engineering	Bioengineering	Peter Lelkes	Protein Hydrogels	Use soy to create hydrogels as 3D scaffolds with bioactive properties	wet lab experience preferred but a motivated student would be considered	30 hrs	3-credit independent study	1
College of Engineering	Bioengineering	Peter Lelkes	Bone Tissue Engineering	Generating composite scaffolds for enhance osteogenic differentiation of stem cells in vitro and enhanced healing of critical sized craniofacial lesions in vivo	wet lab experience preferred but a motivated student would be considered	30 hrs	3-credit independent study	1
College of Engineering	Bioengineering	Peter Lelkes	Electrospinning scaffolds for wound healing	Electrospinning soy scaffolds using blow spraying to create novel scaffolds for wound healing	wet lab experience preferred but a motivated student would be considered	30 hrs	3-credit independent study	1
College of Engineering	Bioengineering	Peter Lelkes	Spinal Cord Regeneration	Freeze casting 3D scaffold for the purpose of promoting nerve growth along specific channels for the application of spinal cord regeneration.	wet lab experience preferred but a motivated student would be considered	30 hrs	3-credit independent study	1
College of Engineering	Bioengineering	Won H. (Jon) Suh	Synthesis of biocompatible photocrosslinked 3D hydrogel membranes	Three-dimensional microenvironment conditions ideal for sustaining mammalian cell cultures will be developed via the conjugation of cross-linkable organic functional groups and peptides on naturally occurring polymers such as alginate, hyaluronan, and gelatin. Students will prepare the polymeric 3D structures in membrane forms and conduct physicochemical characterization experiments such as NMR and mechanical testing. Numerical analysis and plotting acquire data points will be critical parts of this project.	Good time management skills. Have taken and passed one college chemistry and one math course.	30 hrs	3-credit independent study	1
College of Engineering	Bioengineering	Won H. (Jon) Suh	Biocompatibility study of mammalian cells inside 3D hydrogel membranes	Water soluble polymers will be utilized to make three-dimensionally structured hydrogel membranes. Mammalian cells such as PC12 and A549 will be encapsulated and their biocompatibility will be quantified via live-cell microscopy (and biochemical) methodologies. Image analysis and statistical analysis will be critical tools for this project.	Good time management skills. Have taken one college chemistry or biology course.	30 hrs	3-credit independent study	1