**Facilities, Equipment and Other Resources**

**Overview**.

The University of North Carolina at Greensboro (UNCG) is a comprehensive doctoral research institution with approximately $30,000,000 in annual federal research funding support serving 15,783 undergraduates and 3,372 graduate students for Fall 2016. Of these students, 41% of undergraduates (n=6657) and 35% of graduate students (n=1185) are enrolled in Science and Math departments at UNCG. UNCG is classified by The Carnegie Foundation as a Research University with “Higher Research Activity-R2” and a “Community-Engaged Institution”, one of only 50 such institutions in the country to have both.

Of the 17 constituent institutions that comprise the University of NC system, UNCG has the most diverse student population of the majority-serving campuses. UNCG is a Minority Serving Institution with an undergraduate student body in 2016 consisting of approximately 32.1% African Americans and 8.2% Hispanic or Latino Americans. Furthermore, the percentage and count of students from groups underrepresented in science has increased by approximately 60% since 2009. Females now make up ~66% of undergraduate students at UNCG. UNCG also serves a significant proportion of students with financial need, with approximately 45% of UNCG students eligible for need-based Pell Grants in 2015, leading the U.S. Department of Education to officially recognize us as a Title III Part A institution.

UNCG continues to build on a rich history of undergraduate research in biomedical disciplines. A campus survey found that 639 undergraduates were engaged in faculty-mentored research during the 2014 academic year. Women make up ~67 % of these students engaged in undergraduate research, and ~25% are from under-represented race/ethnicity groups.

Graduation rates at UNCG are in line with four-year public institutions (55% six-year graduation rate) and African-American students graduate at a slightly higher rate than their European-American contemporaries. Freshman retention rate has trended up at UNCG, reaching an average of 77% for the Fall 2013-15 cohorts, compared to an average of 75% for Fall 2010-2012 cohorts. UNCG regularly receives national recognition for successes with underserved populations. UNCG is one of just 13 public four-year institutions nationwide, to be featured in a new report by the U.S. Department of Education highlighting institutions across the country that are making significant strides in increasing graduation rates among Pell Grant-eligible students.

**Core Institutional Support**

**Office of Institutional Research.** The mission of the Office of Institutional Research (OIR) is to aggregate, analyze, and disseminate accurate and timely information in support of institutional planning, policy formulation, and decision-making for internal and external constituencies.

The OIR staff develop and support a wide variety of institutional data files, surveys, and reports. In addition, staff members provide consultation, recommendations, and service on institutional committees and work groups to support and advance the mission of the institution.

**Office of Assessment and Accreditation.** The mission of the Office of Assessment and Accreditation is to promote and support a culture of evidence and continuous improvement at UNCG.

The Office of Assessment and Accreditation:

* Seeks to promote the scholarly practice of assessment at UNCG by promoting assessment activities
* Consults with campus committees to address assessment questions and concerns
* Ensures proper academic program planning and reporting
* Coordinates and facilitates administrative and academic assessment training
* Responds to Southern Association of Colleges and Schools (SACS) accreditation requirements

**Instructional Technology Services (ITS) Department.** ITS offers research computing support and training, and provides recommendations for software packages and computing platforms for use in the research or creative process. ITS staff are available help evaluate research technology needs and recommend solutions. Services range from simple consulting for hardware and software purchases to sever hosting and other infrastructure solutions.

UNCG computing environments offer opportunities for communication on campus and throughout the world. A Linux/Apache/PHP architecture powers the academic computing environment providing web hosting, application hosting, file space, and resources for research. Centrally-managed software available to all campus researchers includes a variety of statistical and mathematical analysis programs, such as SAS, SPSS, AMOS, Stata, Matlab and Mathematica; qualitative data analysis software Atlas.ti and on-line survey software Qualtrics. Data and reference management tools such as Microsoft Access and EndNote are also available. The technology infrastructure at UNCG is developed and maintained by a highly qualified team of certified systems, networks, database and infrastructure engineers. UNCG technology Infrastructure and services are monitored centrally by a Service Operations Center that is fully staffed 24x7x365. ITS also maintains a professionally staffed Service Desk that provides a vast array of critical technical support services to the University’s faculty, staff and students, including an online, web-based Self- Service Portal where all members of the faculty, staff, and student community can access support for technical needs 24 hours per day/7 days per week.

**University Libraries**. The library system consists of one central unit, the Walter Clinton Jackson Library, and branch libraries in many colleges.

In addition to an outstanding collection of over 2.4 million volumes of books, government documents, recordings and scores, the Libraries also provide extensive virtual resources through its web site including over 40,000 electronic journals, over 300 databases and over 300,000 electronic books. Most electronic resources may be accessed by researchers from any location. Faculty may borrow directly from the 16 other University of North Carolina libraries and several academic libraries in the Piedmont Triad. Interlibrary loan is available and desktop delivery of articles held in the Libraries in print is also provided. The Libraries maintain over 5,000 web sites on subjects ranging from University Archives and Special Collections to portals for specific courses and databases of our journal holdings. All academic departments and programs have a Libraries’ liaison that work closely with faculty to ensure that the resources fit their needs and to assist with research. Specialized services to faculty include electronic journal publishing support, digital image hosting, data services and digital media services.

The University Libraries hosts an Institutional Repository, NC DOCKS, (https://libres.uncg.edu/ir/uncg/) that houses faculty publication and research so that they are available worldwide to anyone.

**Department of Environmental Health and Safety.** Environmental Health and Safety is a service-oriented organization dedicated to support the University's overall mission by inspiring a cultural environment of shared responsibility. This is accomplished by providing support services that include, but not limited to, education, resources, special services, oversight, and guidance in the following areas:

* Radiation Safety
* Fire and Life Safety
* Biological Safety
* Chemical and Laboratory Safety
* Occupational Safety
* Emergency Management
* Hazardous Waste Management
* Environmental Compliance

**Research Services & Fiscal Management**

The university’s **Office of Research and Engagement** provides intramural research support in the form of competitive grants. These funds are to be used to initiate or enhance research, scholarship, and creative activities. Several types of internal grants are available to support early stage investigators. New Faculty Research Grants are available to untenured, tenure-track faculty below the rank of professor in their first year of appointment. Summer Excellence Research Grants are available to untenured, tenure-track faculty and are used exclusively for summer salary. Competitive Regular Faculty Grants are available to support tenure-track faculty beyond the rank of assistant professor. This grant mechanism is specifically geared towards supporting pilot data collection to inform external grant submissions. In addition to internal grants, other support is available to early stage investigators, such as subsidies in support of publication, media development, and exhibitions that provide resources to supplement charges associated with the publication of books, development of media, exhibition and performance charges, and page charges for publishing manuscripts. There is also a Scholars Travel program that assists faculty in traveling to present the results of their research at professional meetings.

The **Office of Sponsored Programs** supports sponsored research activities at UNCG. This unit is the central point of coordination for sponsored projects and the University's authorized representative for grants, contracts, and other agreements from government agencies, private industry, and non-profit foundations.

**UNCG Office of Contracts & Grants.** The University’s Office of Contracts & Grants (C&G) provides financial oversight for externally-funded grants and contracts. C&G ensures that projects are managed responsibly according to the sponsor’s guidelines.

**Accounts Payable Department.** The Accounts Payable Department is responsible for timely and accurate processing of transactions that are properly authorized in accordance with University policies for payment. It is our goal to work with each department to promote understanding of the University's payment requests' procedures, including proper form use for particular transactions to ensure accurate and efficient processing of accounts payable transactions. In addition to University policies and procedures, the Accounts Payable Department is responsible for compliance with state sales and use tax, state personal services withholding tax, and federal 1099 reporting requirements.

**Office of Research Integrity (ORI).** The Office of Research Integrity (ORI) coordinates compliance measures on campus and acts as a resource for the university community's concerns regarding compliance requirements. ORI offers training and workshops for faculty and staff who are involved in research and scholarly activities. The Institutional Review Board (IRB) is in place to ensure that human subjects involved in research are adequately protected and that the institution remains in compliance with regulations. Prior to the initiation of any research efforts that involve human subjects, the IRB review is required.

**Office of Innovation Commercialization.** As part of its educational, research, and service mission, The University of North Carolina at Greensboro is dedicated to the transfer of its research and technology to the public sector for the general economic benefit of Greensboro, the Piedmont Triad and North Carolina.

The mission of the Office of Innovation Commercialization (OIC) is to support UNCG’s effort to encourage innovation and disseminate knowledge. OIC serves the university and the public by commercializing discoveries developed by faculty, students and staff. OIC also assists faculty in obtaining research support from corporate sponsors.

Some specific functions of the office include: consulting on intellectual property and technology transfer, determining patentability and assessing commercial potential of the disclosed inventions, administering the patent process, negotiating licensing agreements, and supporting UNCG inventors in establishing start-up companies to commercialize their inventions.

**Institute for Community and Economic Engagement**. ICEE provides one highly visible point of contact for the external community for campus activities related to community and economic development, while providing structure to and support for UNCG faculty, staff, and students interested in community-engaged research, teaching, and scholarship. ICEE brings together community engagement and economic development within one institute in the recognition that pressing social and environmental issues are complex, multi-faceted, and interconnected, and therefore, must be addressed through a full range of approaches and by a full array of stakeholders.

**STEM Departments at UNCG**

**Anthropology**

The Department of Anthropology is located in the Graham Building at UNCG. The Department has a number of different labs where students and faculty work together on a variety of research projects in all areas of Anthropology, as well as a teaching lab in Room 140 of the Sullivan Science Building. Major labs include the Zooarchaeology Lab (Dr. Egeland, Graham 405), Osteology Lab (Dr. Egeland, Graham 408), Paleontology Lab (Dr. Anemone, Graham 408A), Latin American Archaeology Lab (Dr. Nash, Graham 450-451), Historic Archaeology Lab (Dr. Stine, McIver 52), Nutrition Education Lab (Dr. Murphy, Graham 418), and the 3D Imaging Laboratory. Enrollment as of Fall 2016 consisted of 93 undergraduate students.

**Biology**

The UNCG Biology Department is housed in the Eberhart and Sullivan Science buildings and provides sufficient office and research space for faculty and students, as well as equipment in support of active research and teaching. Faculty in the Department have external funding to support their research from multiple federal agencies including the EPA, NIH (R01, R15, R21), NSF, and USDA. Some of the available equipment includes: one Applied Biosystems StepOne Plus RT-PCR cyclers, a Nanodrop spectrophotometer, a cluster of 8 regular thermal cyclers, one DNA micro-array reader (Axon GenePix 4000B microarray scanner, with GenePix ProScan and Acuity 3.0 software), a Biorad Molecular Imager ChemiDoc XRS System, an Affymetrix 417 gene arrayer, two Licor 4300 DNA analyzers, one MegaBace sequencer, Olympus Fluoview FV5OO/IX81confocal microscope, and a Keyence Florescent Microscope. We offer shared core space and equipment for both field and molecular biology.

Biology has the largest enrollment among STEM departments at UNCG, with ~1000 Undergraduates (BS and BA) and 50 graduate students (PhD and MS) as of Fall 2017. We offer a full range of courses to students pursuing a degree in Biology, as well as to non-biology majors interested in the biological sciences. We offer degree concentrations in Biotechnology, Environmental Biology, or Human Biology. Our graduate programs include an MS in Biology and a PhD in Environmental Health Science.

**Chemistry & Biochemistry**

The Department of Chemistry and Biochemistry is located in the Sullivan Science Building at the University of North Carolina at Greensboro, a state-of-the-art facility completed in 2003 that includes over 172,000 sq. ft. of research and teaching space. The department currently has 11 teaching laboratories, 18 laboratories devoted to research. In addition, the Department has core laboratory facilities for NMR Spectroscopy, Mass Spectometry, a Molecular Graphics Lab, High Performance Computing, and an Electronics Support Facility. Current research funding to faculty in the Department includes sources such as NIH (e.g. multiple R01, R15, T32, U54), NSF (e.g. CAREER), and industry contracts.

The General Chemistry Laboratory facilities consist of four laboratory rooms of 1200 sq. ft. with design capacity of 24 students each. Each room contains 12 two-person work stations inside of full ventilation hoods designed for 100% exhaust. Community workbenches provide another 50 linear feet of work area. Twelve computer workstations with extensive experimental probeware (temperature, pH, conductivity, voltage, radiation monitor, and spectrometers) are available at the student work stations in each room. The computers are supported by a central server and printing systems. The lab facilities are supported by three prep/storage rooms with 700 sq.ft. of storage and work space. Adjacent classrooms of 24 or 48 seat capacity are available for prelab discussion.

The Department has a current enrollment of 365 undergraduate students (B.A. and B.S.) 38 graduate students (M.S. and Ph.D.) as of Fall 2016.

**Computer Science**

The Department of Computer Science is housed in the Petty Building, which was fully renovated in 2008. The Petty Building includes first-class resources research and education facilities that will be used in this project. The Petty Building contains a number of special-purpose research labs, including the SPAN (Security, Privacy, and Networking) Lab. The SPAN Lab is a research laboratory that is equipped with a diverse array of machine architectures and operating systems, as well as desktop systems for use by current research assistants. This lab includes racks for computer equipment as well as a Hadoop cluster for Big Data computing. The Database, Data Mining, and Analytics (DbDMA) lab consist of high throughput machine capable of data intensive computing available for graduate research assistants.

Classes and meetings are often held in one of the numerous classrooms in the Petty Building, all of which include an integrated teaching station with computer and projection facilities. Two computer labs in the Petty Building are utilized for instructional purposes including a computer lab with 43 workstations and a second lab with 20 workstations. The department has an enrollment of 444 undergraduate students and 38 graduate students as of Fall 2016. While the primary software resources needed by this project are all free and open source, the university provides a large collection of licensed commercial software for general university use.

The department along with Information Technology Services (ITS) at UNCG also has a partnership with NC State to provide UNCG faculty, staff and students with access to the "Henry 2" High Performance Computing (HPC) Linux cluster. The Henry 2 cluster is comprised of 1,000 computer nodes, many of which have multi-core processors, providing computing power that far surpasses that of a desktop computers.

**Economics**

The Economics Department is located in the Bryan School of Business and Economics Building at UNCG. The department has 13 tenure or tenure track faculty, plus 5 adjunct faculty and one non-tenure track instructor. Current external funding for research includes awards from the National Institutes of Health (NIH), National Institute of Standards and Technology (NIST), Department of Commerce (DOC), Pharmaceutical Research and Manufacturers of America Foundation (PhRMA), and the US Department of Agriculture. The department maintains a secure data lab in its departmental offices. The lab has restricted keyed access, three large digital safes with unique key-pad entry for data storage, two networked workstations, and three locked down workstations with all networking disabled and user credentials/passwords isolated to the specific contract/letter of agreement for authorized personnel only. Workstations include Dell T3610s, Lenovo ThinkCentre M series (M90), Dell Optiplex 780, and Dell Optiplex 9010. All workstations are equipped with dual monitors; upgraded processors, RAM and memory; and standard software including STATA/MP 14 and SAS to support large data research. Data currently in use in the restricted lab includes data use agreements with the National Center for Education Statistics – Institute of Education Sciences, the North Carolina Education Research Data Center, Centers for Medicare and Medicaid Services and AddHealth through the University of North Carolina at Chapel Hill. These large data sets are primarily used for investigations of behaviors, services, and outcomes in the areas of health and education. The department has an enrollment of 159 undergraduate students and 33 graduate students as of Fall 2017.

**Geography**

The Geography Department is located in the Graham Building, which houses several state-of-the-art research and teaching labs. The Geomorphology and Weather and Climate Lab includes a wide variety of aerial photographs and satellite images, twenty student stereoscopes and ten professional stereoscopes, rock and mineral collection and dendrochronology cores, and large map collection, as well as a devoted SPSS and climatology computer area. The Carolina Tree-Ring Science Laboratory is dedicated to wood-sample preparation, crossdating, and measurement; this lab is equipped to conduct virtually all types of dendroecology and dendroclimatology projects. The Laboratory for the Analysis of Earth Regolith (LAER) is devoted to hydrogeomorphic research requiring analyses of unconsolidated earth surface materials, and is particularly well-equipped for the mineral magnetic characterization of sediments and soils. The Center for Geographic Information Science (CGISc) is an educational research entity that focuses on geographic information systems, remote sensing and image processing, cartography, engineering, and mathematics. The CGISc is well equipped with computers, specialized hardware, and a full range of geospatial software. The Geography department Field Station at Lindale Farms is situated on approximately 130 acres with a diversity of natural landscapes that offer a range of teaching and research activities-including work in the areas of biogeography, hydrology, meteorology, geomorphology, and GIS. Available for use at the field station is a variety of equipment and instrumentation, including micrometeorological instruments, water quality and water flow instrumentation, and GPS and mapping equipment. Finally, our Summer field course, has focused on the physical and regional geography of regions such as the Canadian Rockies, the Central Rocky Mountains, the desert Southwest, and the Pacific Northwest. The Department has 38 graduate students 66 undergraduate students as of Fall 2016.

**Mathematics and Statistics**

The Department of Mathematics and Statistics is located in the Petty Science building, which provides students with access to several computing and networking options. Some of these resources overlap with the computer science department (see above). The computer lab in Petty 211 houses 20 computers (19 Dell Optiplex 780's with Quad-core Intel Core2 3.0 GHz CPUs, 4GB of RAM, 250 GB Hard Drives, and 22" flat panel monitors, 1 Apple iMac 27” with Quad-core Intel i5 2.66GHz CPU, 8GB of RAM, 1TB Hard Drive), and the Graduate Assistant lab in Petty 101 houses nine Lenovo ThinkCentre 7484-BA4 desktops with Dual-core Intel Core2 3.0 GHz CPUs, 4GB of RAM, 500 GB Hard Drives, and 19” flat panel monitors. The software on each of these is up-to-date and has access enabled to network file space, printers and scanners. All equipment is connected to the University network via 1Gbit full-duplex switched Ethernet, and the campus provides individual workstations available to all students and a 16-core Intel x64 based Linux server with 64GB of RAM for computational research. The department has an enrollment of 112 undergraduate students and 42 graduate students as of Fall 2016.

**Nanoscience**

The Department of Nanoscience is housed in a state of the art 105,000 square foot facility, which features extensive labs and clean rooms. JSNN faculty and students have access to a sophisticated suite of tools including the only Carl Zeiss Helium Ion Microscope in the southeast (one of four in North America). The facilities at the JSNN provide an ideal teaming environment to facilitate interdisciplinary research in areas of genomics, nanbioelectronics, nanobiology including nanopharmacology, nanomaterials and nanocomputing. This equipment includes instruments for analytical chemistry, biophysics, clean room, magnetic resonance imaging, material testing, and nanofabrication. The genomics laboratory is a fully equipped molecular biology laboratory that includes an Illumina MiSeq desktop sequencer and a Illumina Neo-Prep for preparation of genomic libraries.

JSNN offers Masters and Doctoral degrees in both Nanoscience and Nanotechnology. Through these degrees, the mission of the Nanoschool is to train students to conduct basic and applied research in nanoscience and nanoengineering, and to work closely with the Piedmont Triad community to help enhance opportunities for economic and academic growth through its outreach and engagement activities. The department has an enrollment of 383 undergraduate students and 48 graduate students as of Fall 2016.

**Physics and astronomy**

The Department of Physics is housed in the Petty Science building. It provides office and research space to be utilized by faculty and students. Two labs are used for undergraduate courses; each lab has twelve workstations, with desktop computers. The department is equipped with all basic lab equipment, including a PTI fluorescence Spectrometer (model QM1) with two emission channels, a Kinetic Instruments stopped-flow spectrometer (5 ms dead time), a Beckman L70 floor-model ultracentrifuge (with Ti50.2, Ti70, and SW28 rotors), and a Beckman Airfuge table-top ultracentrifuge with A-100 rotor (for small volumes) in addition to standard minor equipment for biochemical protein research. The Physics Department also houses a small Planetarium. The department has an enrollment of 56 graduate students as of Fall 2016.

**Political science**

The Political Science Department is located in the Curry Building at UNCG. The department has 14 tenure or tenure track faculty. The department has an enrollment of 279 undergraduate students and 81 graduate students as of Fall 2016.

**Psychology**

The Department of Psychology research labs include the following:

The Developmental Psychobiology lab has 6 rooms with 12 Lenovo computers for video coding and data analysis linked with an intranet to a separate server. The lab has seven keys for using Noldus Observer 10.5 for coding and the computers have access to the most modern SPSS, SAS, R and M-Plus statistical programs.

The Cognitive Psychology lab consists of one large group testing room (for up to 6 participants, each at a separate computer workstation) and two individual testing rooms (each with one computer workstation). The lab rooms are located in the Department of Psychology; all are locked and secure when not in use. The lab has 8 Dell PCs dedicated to behavioral data collection for various projects, and 4 additional networked computers in a separate room for data analysis.

The Social Psychology lab includes a large room for group-based data collection and two small rooms for running individuals or small groups. All rooms contain desktop and laptop PCs, laser printers, software for data collection (MediaLab & DirectRT), and high-speed keyboards and response pads for precise response-time data acquisition. The rooms are partitioned so that data can be collected from several computers at a time if desired. One room contains locked cabinets for storing data and research material. The lab rooms are locked and secure when not in use. One of the dedicated lab rooms is devoted to conducting psychophysiological studies. It is equipped with a Mindware BioNex chassis for collecting impedance cardiography and skin conductance data as well as the related Mindware suite of software (BioLab, HRV, IMP, EDA, and Compiler) for screening, editing, analyzing, and compiling the data. For ambulatory research, it contains a Mindware ambulatory impedance cardiography device, which is capable of collecting up to 24-hours of signals that can be transmitted wirelessly or saved to a local SD card.

The Cognitive Development lab includes space for greeting families, three functional testing rooms (including two that are connected via a 1-way mirror for observation), coding facilities, and office space for project staff and graduate students. In addition, the department offers common space for staff meetings and a child friendly room for the babysitting of siblings. Two high-volume copiers are available in the department for making participant survey packets, and ample space is available for assembling the packets before mailing. The lab has 5 desktop computers and 2 laptops (including one with touch-screen capabilities).

The Developmental Psychopathology lab includes five rooms of varying sizes, three desktop computers and two laptop computers.

The department has an enrollment of 872 undergraduate students and 58 graduate students as of Fall 2016.

**Sociology**

The Sociology Department is located in the Graham Building at UNCG. The department has 11 tenure or tenure track faculty. Faculty in the department have recent external funding for research from the National Science Foundation (NSF). The department has an enrollment of 421 undergraduate students and 33 graduate students as of Fall 2016.