UNC CHARLOTTE

Office of the Chancellor

9201 University City Blvd, Charlotte, NC 28223-0001
t/ 704.687.5700 f/ 704.687.1700 www.uncc.edu

May 5, 2017

Dr. Kimberly van Noort
Vice President for Academic Programs and Instructional Strategy
University of North Carolina
Post Office Box 2688
Chapel Hill, North Carolina 27515-2688

Dear Kim:

Enclosed is UNC Charlotte's Request to Establish a M.S. in Architecture. The proposed program prepares students for careers in research and technology, critical and emerging areas in the architecture field. The new program will offer opportunities for deeper exploration of critical issues in architecture including sustainability, technological change, and integrated design.

Thank you for your consideration of this request. Provost Joan Lorden or I would be pleased to respond to any questions that you may have.

Cordially,

Phil

Philip L. Dubois
Chancellor

cc: Joan F. Lorden, Provost and Vice Chancellor for Academic Affairs
Ken Lambla, Dean, College of Arts + Architecture

UNC CHARLOTTE

Office of Academic Affairs

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May 5, 2017

Dr. Kimberly van Noort
Vice President for Academic Programs and Instructional Strategy
University of North Carolina
Post Office Box 2688
Chapel Hill, North Carolina 27515-2688

Dear Kim,

Enclosed is UNC Charlotte's Request to Establish a M.S. in Architecture. The proposal provides a summary budget, which includes tuition differential and enrollment increase funds. UNC Charlotte is committed to funding the expenses for the degree as described by reallocating funds, if needed.

Thank you for your consideration of this request.

Sincerely,

Joan F. Lorden
Provost and Vice Chancellor for Academic Affairs

UNIVERSITY OF NORTH CAROLINA
REQUEST TO ESTABLISH
A NEW DEGREE PROGRAM – ANY DELIVERY METHOD

Date: May 5, 2017

Constituent Institution: UNC Charlotte

Is the proposed program a joint degree program? Yes____ No **X**

Joint Partner campus _____

Title of Authorized Program: Architecture Degree Abbreviation: M.S.

CIP Code (6-digit): 04.0902 Level: B _____ M **X** D _____

CIP Code Title: Architectural and Building Sciences/Technology

Does the program require one or more UNC Teacher Licensure Specialty Area Code? Yes_____ No **X**

If yes, list suggested UNC Specialty Area Code(s) here N/A

If master's, is it a terminal master's (i.e. not solely awarded en route to Ph.D.)? Yes X No____

Proposed term to enroll first students in degree program: *Term* Fall *Year* 2018

Provide a brief statement from the university SACSCOC liaison regarding whether the new program is or is not a substantive change.

The UNC Charlotte Office of Assessment and Accreditation has stated that: "Since the degree is built using existing courses from an approved program, this is not a SACSCOC substantive change" (Feb. 28, 2017).

Identify the objective of this request (select one or more of the following)

☒Launch new program on campus

☐Launch new program online; Maximum percent offered online _____

☐Program will be listed in UNC Online

☐One or more online courses in the program will be listed in UNC Online

☐Launch new site-based program (list new sites below; add lines as needed)

☐Instructor present (off-campus delivery)

☐Instructor remote (site-based distance education)

Site #1

N/A

(address, city, county, state) *(max. percent offered at site)*

Site #2

N/A

(address, city, county, state) *(max. percent offered at site)*

Site #3

N/A

(address, city, county, state) *(max. percent offered at site)*

Supply basic program information for UNC Academic Program Inventory (API) and UNC Online

Minimum credit hours required	30
Expected number of full-time terms to completion	3

Do the following sections of your previously submitted and approved Request to Plan document require any change or updated information? If yes, note the items and explain.

Review Status (Campus)	Yes_____	No____X___
Description and Purpose	Yes__X___	No_____
Student Demand	Yes_____	No_____X__
Societal Demand	Yes_____	No_____X__
Unnecessary Duplication	Yes_____	No____ X___
Enrollment	Yes_____	No_____X__

Since the Request to Plan proposal was submitted, the M.S. in Architecture curriculum proposal has been reviewed by the School of Architecture (SoA) Curriculum Committee. Through this process, it has been determined that a 30 credit hour (minimum) program fits the School's needs and supports the School's 2015-20 Strategic Plan. However, though the School's Curriculum Committee discussions, it has become clear that the previous CIP Code should be changed to reflect the STEM-based research opportunities presented by the M.S. in Architecture. Therefore, the CIP Code for the proposed M.S. in Architecture has been changed to reflect the program's STEM-based curriculum. We have also determined that we are in a position to offer two areas of concentration at the launch of the program both of which will utilize existing coursework; those concentration areas will be Digital Technologies + Material Systems and Design Science + Building Systems. Each builds upon our previous research as demonstrated in our previous Request to Plan. The Request to Establish document is now in the Curriculog (faculty governance) process. It was given a preliminary reading by UNC Charlotte's Graduate Council during its April 4, 2017 meeting, and was approved after full review at the Graduate Council's May 2nd, 2017 meeting.

Executive Summary:
Non-Professional Master of Science in Architecture in the School of Architecture at UNC Charlotte

The proposed Master of Science (M.S.) in Architecture focuses on emerging research critical to the architectural profession, which requires expertise that exceeds current criteria for accredited professional degrees. Thus, the M.S. in Architecture is distinct from the nationally-accredited Master of Architecture (M.Arch.) currently offered at UNC Charlotte. The M.Arch. is a degree awarded only in association with programs that prepare students for professional licensure as required by the National Architectural Accrediting Board (NAAB).

The M.S. in Architecture is an on-campus (full-time, 30 credit hour) curriculum made up of core requirements (21 credit hours) and elective coursework which allow students to concentrate their research interests in areas that address emerging research needs within the architectural profession (9 credit hours).

The demand for research-based architectural degrees is growing. According to *DesignIntelligence*'s Best Architecture Schools 2015 report, which polled 78 deans and chairs and over 1,000 architectural offices from across the country, the most significant concerns facing the profession include sustainability (49%), technological change (42%), and integrated design (47%).[1] Similarly, the priorities of the American Institute of Architects focus on new technological and research methods. In each case, these research areas represent educational needs that are not fully met by professionally accredited degree programs. While the School of Architecture's (SoA) professional Master of Architecture (M.Arch.) degree prepares students for general practice, a research-based M.S. in Architecture will offer opportunities for deeper exploration of critical issues facing the profession and society through a non-professional degree path.

UNC Charlotte has previously addressed the profession's research needs through a track in the M. Arch. Degree. New accreditation criteria established by the National Architectural Accreditation Board (NAAB), which accredits professional schools of architecture and their professional degrees, make it impossible to continue offering a separate research-based degree path, Track III, in our Master of Architecture (M.Arch.) degree. In its policies, the NAAB states that the use of the term "Master of Architecture" (M.Arch.) can only be used for the professional degree in architecture. Thus, our current degree structure is in conflict with new accreditation standards set for architectural programs leading to registration:

- The National Architectural Accreditation Board has established a policy, which states that the practice of using the Master of Architecture nomenclature for unaccredited degrees is a violation of Condition II.2.2 of the *NAAB Conditions for Accreditation*.

Therefore, Track III of the current Master of Architecture in the SoA will be converted to the non-licensure (non-professional), non-accredited Master of Science (M.S.) in Architecture. The proposed M.S. will enable us to comply with accreditation standards for schools of architecture and it will convert the current Track III within the M.Arch. into a robust and independent program of study.[2]

[1] Respondents were allowed to provide multiple answers to each question presented in the survey.

[2] The Master of Architecture (M.Arch.) is a professional (accredited) degree required to become a licensed architect and to practice architecture in North Carolina and/or the United States. M.Arch. programs typically vary in length from 2 to 3.5 years, depending on academic preparation at the undergraduate level.

The M.S. in Architecture degree will allow UNC Charlotte to offer a graduate course of study that meets the growing marketplace demand for architectural research while broadening the pool of potential students eligible to apply to the SoA. The M.S. in Architecture is most appropriate for students interested in pursuing advanced research at the graduate level. Currently, students interested in pursuing advanced research in architecture at the Master of Science level must leave the state to continue their education.

Our experience with our research-based Track III has been very positive and suggests that the proposed M.S. in Architecture will prove attractive to future prospective students. This track is in its fourth year and has graduated 7 students and includes 7 currently enrolled students (as of spring 2016). We expect to enroll 8 to 12 students per year in the Master of Science in Architecture by 2020.

Lastly, no programs or universities in the state of North Carolina offer a non-professional Master of Science in Architecture degree. Therefore, our proposed M.S. in Architecture will not be duplicative.

I. Program Requirements and Curriculum

A. Program Planning

1. List the names of institutions with similar degree programs regarded as high quality programs by the developers of the proposed program.

Due to increased research needs in both the profession and the academy, post-professional and non-professional degrees in Architecture such as the Master of Science (M.S.) in Architecture have increased in number across the U.S. over the past decade. Currently, non-professional M.S. in Architecture degrees are offered in at least 21 states.[3]

We regard several programs (Tables 1 and 2) as high quality models for our proposed program (those designated with an asterisk [*] denote non-professional degrees):

Table 1. U.S. Schools Offering High Quality Post-Professional and Non-Professional Master of Science (M.S.) in Architecture Degrees

State	*Institution*
Georgia	Georgia Institute of Technology
Massachusetts	Massachusetts Institute of Technology
Michigan	University of Michigan
Pennsylvania	University of Pennsylvania
South Carolina	Clemson University
Texas	Texas A&M University
Virginia	Virginia Polytechnic Institute and State University*

[3] A list of these programs can be found in the Request to Plan documentation that accompanies this Request to Establish.

Table 2. Schools within the Southeast Region Offering Non-Professional Master of Science (M.S.) in Architecture[4]

State	*Institution*	*Degree*	*Concentrations*
Florida	University of Florida	M.S. in Arch. Studies	Hist./Theory Pedagogy Preservation Sustainability Technology
Virginia	Virginia Polytechnic Institute and State University	M.S. in Architecture	Building Science Interior Design Urban Design

Of the schools in the region offering the M.S. in Architecture degree, none offer non-professional degrees with concentrations specifically focused in Design, Computation and/or Material Studies. Therefore, UNC Charlotte has the opportunity to become a leader within the Southeastern region in architectural research. The creation of an M.S. in Architecture will allow the School of Architecture (SoA) at UNC Charlotte to clearly distinguish a new non-professional research degree from its nationally-accredited professional Master of Architecture degree and will enable the SoA to expand and diversify its current degree portfolio (Table 3).

Table 3. UNC Charlotte School of Architecture Degree Portfolio

Bachelor of Arts in Architecture (B.A.)	pre-professional, non-accredited
Bachelor of Architecture (B.Arch.)	professional, accredited
Master of Architecture (M.Arch.)	professional, accredited
Master of Urban Design (M.U.D.)	non-professional, non-accredited
Master of Science in Architecture (proposed)	*non-professional, non-accredited*

The Master of Science (M.S.) degree is based on specialized research in the built environment intended to offer areas of expertise within the architectural and design industries not covered in professional architectural curricula. M.S. programs across the region and country typically provide areas of specialization that open new opportunities in computation, diagnostics, fabrication, technology, or sustainability (to name a few).

[4] While these universities offer a non-professional Master of Science in Architecture degree, each program is described as appropriate for applicants holding a professional architecture degree (M.Arch. or B.Arch.) or a related design degree. These programs differ from the proposed M.S. in Architecture at UNC Charlotte in that our proposed program will be open to applicants from non-design and non-professional backgrounds such as Computer Science.

These areas may overlap with some aspects of architectural practice; however, as a non-professional degree, the M.S. will not enable someone to practice architecture. Instead, the M.S. will provide specialized expertise that supports a range of practices within the design industries and building related IT services. Thus, the M.S. in Architecture will address changes in the practice of architecture and the increased premium placed on technology and specialized tasks and support areas that are needed in practice-based research teams, projects, and environments.

One unique aspect of our proposed M.S. in Architecture is that it does not require applicants to hold a professional degree in architecture in order to apply. Students with backgrounds in related fields can also enroll in the program. In addition to broadening the pool of eligible students for the SoA, the M.S. in Architecture can serve as a feeder to PhD programs in the College of Computing and Informatics (CCI) and inter-disciplinary doctoral programs such as Infrastructure and Environmental Systems (INES) offered at UNC Charlotte. Exposure to coursework in CCI and ongoing collaborative research involving faculty from both Architecture and Computing and Informatics have been aspects of our current program that students have found attractive. For example, two students from UNC Charlotte's existing Dual Masters in Architecture and Information Technology enrolled in the PhD program in Computing and Informatics following their enrollment in the SoA. The Dean of CCI points to the possibility of the proposed M.S. in Architecture providing potential recruits for his PhD programs in his letter of support (see Request to Plan, Appendix B).

By establishing an entry point for students with novel backgrounds and diverse knowledge domains, the M.S. in Architecture will provide access to students interested in a career within the broader fields involving the built environment without having to overcome the barrier of prior training in an accredited degree program.[5] By reducing barriers to graduate education in areas of specialization that support architectural practices, the M.S. in Architecture will help diversify both our student population and the future workforce at large.

2. List institutions visited or consulted in developing this proposal. Also discuss or append any consultants' reports or committee findings generated in planning the proposed program.

In examining trends in the architectural marketplace, it has become clear that research expertise that compliments the traditional training of an accredited degree has become necessary. Due to increased research needs in both the profession and the academy, non-

[5] The M.S. in Architecture will not enable a student to go on to become a licensed architect. Only the Master of Architecture provides the foundation for licensure; however, the M.S. can be combined with an M.Arch., which will then support architectural licensure. Graduates holding only an M.S. in Architecture will provide research expertise and support to architects and allied professionals in the field.

professional and post-professional degrees in Architecture such as the Master of Science (M.S.) in Architecture have increased in number across the U.S. over the past decade.[6]

Typically, M.S. in Architecture programs may vary in length from 1 to 2 years. The most common models are 32 or 36 credit hours in length and follow a fall/spring/fall or fall/spring/fall/spring calendar. Our proposed M.S. in Architecture program will follow a 30 credit hour format.

- Institutions Consulted
  - Virginia Polytechnic and State University
    Communication by email with David Dugas, Chair-Graduate Programs, in both fall and spring (2016-17) and an in-depth review of Virginia Tech's online degree program description and program of study options (non-thesis/coursework only, project and report/capstone, and thesis) have provided very useful information. Specifically, Virginia Tech's model of thesis and capstone options has provided examples for our curriculum and its culminating requirements. Like Virginia Tech, Master of Science in Architecture students at UNC Charlotte will be required to pursue either coursework culminating in a Master's thesis project or coursework culminating in a Capstone Project and Report. Unlike Virginia Tech's model, students at UNC Charlotte will not have the option of a coursework-only degree path; all UNC Charlotte M.S. in Architecture students will complete a Thesis or Capstone project.

    Additionally, Virginia Tech's M.S. in Architecture is a non-professional degree path intended to offer its graduates opportunities to pursue diverse career paths that support and interrelate with architectural design, building science, and other professions engaged in shaping the built environment. The proposed M.S. in Architecture at UNC Charlotte has similar goals. The admissions requirements and curricular structure demonstrated by Virginia Tech offered useful examples for our program.

  - North Carolina State University
    North Carolina State University (NC State) is the only other institution in North Carolina that offers graduate degrees in Architecture. Its degree offerings include an accredited, professional Master of Architecture (M.Arch.) that parallels UNC Charlotte's professional degree program (M.Arch.).

    In a recent telephone conversation (August 2, 2016) with Dr. Soolyeon Cho, the Director of NC State's PhD in Design and Certificate programs in the College of Design, it was confirmed that NC State does not currently offer a non-professional degree at the Master's level in architecture. NC State offers a 15 credit hour certificate in Energy and Technology in Architecture to its students enrolled in its professional Master of Architecture program and also offers certificates in City Design and Public Interest Design. However, these

[6] Non-professional degree paths do not require that an applicant hold an accredited degree in Architecture. Post-professional degree paths do require prior accredited degrees from professional programs such as Architecture and/or Landscape Architecture.

represent concentrations within a professional program and not stand-alone research degrees.

NC State also offers a 1-year 30-credit-hour post-professional Master of Architecture with concentrations in the same areas as their certificates. However, that program requires an undergraduate Bachelor of Architecture (professional) degree for admission. It is for this reason that the program can be called a Master of Architecture but cannot accept students with non-architecture backgrounds.

Finally, NC State also offers a Doctorate in Design[7]. While research-focused, NC State's Doctorate of Design differs significantly in duration (5 to 7 years) and scope from the proposed M.S. in Architecture.

Our proposed M.S. in Architecture degree differs materially from programs offered at NC State.

- Industry Research and Alumni Survey
    - Area, occupation, and industry profiles.
      Charlotte is the largest architectural market in North Carolina and the Charlotte chapter of the American Institute of Architects (AIA) has over 800 members, the largest chapter in the State. Charlotte's 130 architectural design firms comprise the second largest concentration of architectural professionals in the South Atlantic region (after Atlanta) and include large branch offices for many of the country's largest design firms. This includes firms such as Gensler, Perkins + Will, HDR, and Perkins Eastman, all of which are listed in the top 12 of the 2015 Top 300 Architecture Firms in the U.S., ranked by revenue (as reported by Architectural Record in 2016). Several of these firms have provided Letters of Support for this proposal (see Request to Plan, Appendix B).

[7] Other models of advanced study exist within architectural education such as:

- The Doctor of Design (D.Des.) is an advanced design-based research degree aimed at design professionals who seek to augment their skills in order to transform and/or extend their practices (Carnegie Mellon) or to apply multidisciplinary research approaches to design-based investigations (Harvard). The D.Des. degree may also introduce opportunities to work in academia or research-driven environments. The D.Des. is not required for architectural practice or for most specialized areas within the design industries. D.Des. programs are typically 3 years in length.
- The Ph.D. in Design (NC State, Virginia Tech., Georgia Tech., Michigan, etc.) is an academic and research-based degree aimed at advancing knowledge within a multi-disciplinary environment focused upon design disciplines. This requires original research in a specific area related to architectural or design disciplines. The Ph.D. is the more common path for individuals who plan to engage an academic career or a career in which research plays a primary role. This differs from the D.Des. in the sense that the Ph.D. is not typically an avenue for design professionals who are interested in advancing their practices; the Ph.D. is not required for architectural practice. Ph.D. programs are typically 5 to 7 years in length.

Most of these offices have building performance, diagnostics, simulation, data analysis and computation-focused departments that use technology and research to develop new tools for the design and evaluation of the built environment. For example, James R. Langlois (Principal and Vice President of HDR Architecture) states in his letter of support that a research-based M.S. in Architecture "will be of great interest" as his firm plans for future recruitment efforts; David J. Segmiller (Managing Principal and Board Director of Perkins Eastman) states that the expertise gained by such a research-based degree will "contribute significantly" to the success of his firm (see Request to Plan, Appendix B).

Additionally, the June 2014 UNC Charlotte Graduate Enrollment Strategic Planning document (see Request to Plan, Appendix C), prepared by the consulting research firm Eduventures, places architecture among the top ten growth areas in Masters level degree programs for the University. Eduventures points to the growing demand in the architectural marketplace for architectural graduates, acknowledging that growth in the marketplace has outpaced the numbers of prospective employees entering into the field. As a result, there is growing demand from architectural firms for graduates from architectural programs. As the 16th largest city in the U.S. and one of the fastest growing urban centers, Charlotte is an ideal location for the growth of graduate programs focused on specializations within architecture and related disciplines. Graduates with an M.S. in Architecture degree from UNC Charlotte will have an immediate impact in the field by advancing research and through leadership in the profession.

- NC occupational and employment projections.
  According to the Occupational Analysis for Architects on NCWorks, "Employment of architects is projected to grow 17% from 2012 to 2022, faster than the average for all occupations. Competition for jobs will be strong as the number of applicants continues to outnumber available positions." According to the 2015 University of North Carolina Alumni Survey: University of North Carolina at Charlotte Report, 9% of UNC Charlotte alumni are in Architecture and Engineering fields. Offering students specializations within the field of architecture through the non-professional Master of Science (M.S.) in Architecture degree will contribute to their leadership, marketability and employability in this growing, competitive field.

  Many of the largest firms in the country have in recent years added departments or divisions dedicated specifically to research, including Gensler, SOM, Perkins + Will, Perkins Eastman, and HDR. All of these national firms (except SOM) have offices in Charlotte. For example, Gensler, the largest architectural firm in the country by revenue, includes Building Performance, Sustainability, and Data Exploration among its research themes – all of which intersect with concentrations for the proposed M.S. in Architecture degree. In fact, their "Student and Graduate Career Guide" lists that their workforce represents many backgrounds and areas of expertise including information management specialists and states that their design process is based upon "deep and thoughtful research." Similarly, HDR, a national architecture, engineering and construction services firm, recently (August 2016) posted a "Digital Practice Office Leader" job announcement with primary required job skills in the areas of digital technologies, information management, computational design, and related delivery services.

These research themes do not overlap with current criteria required of broad-based accredited architectural programs, including the professionally-oriented and nationally-accredited M.Arch. The need for accredited architectural programs to address a comprehensive list of professional criteria in relatively short timeframes and limited credit hours results in an academic environment in which these critical issues are introduced but not explored in depth. The M.S. in Architecture will address both the needs of firms like Gensler seeking research skills and those of a firm like HDR who seek computational expertise as these architectural offices take on increasingly complex research agendas.

- Economic and demographic indicators.
  According to the *Occupational Trends in a Transitioning Economy* report published by the NC Department of Commerce in November 2008, architectural, engineering, and related services is one of the top five emerging industry clusters in North Carolina. According to the NC Department of Commerce's more recent *2010-2020 North Carolina Occupational Employment Projections*, an average of 2,000 new job positions open each year in architectural and engineering fields in the state and 1,210 other jobs become available annually due to retirement or resignation of existing employees. In that same report, the rate of growth in these fields in North Carolina between 2010 and 2020 was projected at 25.5% for architects. Recent studies continue to point to positive growth trends.

  As of August of 2016:

  - employment projections remain steady with projected annualized growth of 1.0% and annual openings of 1,350 according to NC Department of Commerce website (http://nccareers.org/employmentprojections/occupation_employment_projections.html); and

  - the Bureau of Labor Statistics points to 2.7% grown in its 2024 projections (http://www.bls.gov/news.release/ecopro.t04.htm).

  Graduates who hold an M.S. in Architecture degree in addition to a professional degree in architecture will have a competitive advantage in the marketplace as a result of their specialization and advanced skills.

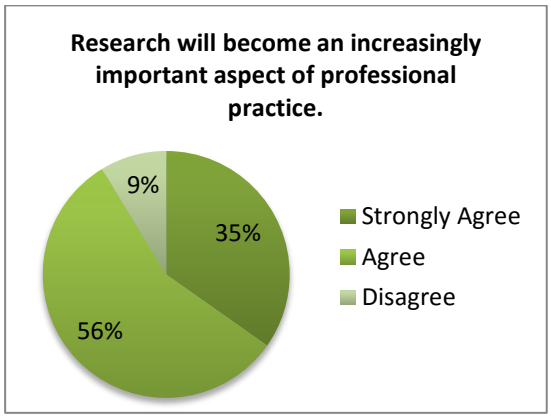
- National occupational and industry projections**.**
  The *Occupational Outlook Handbook* of the US Bureau of Labor Statistics corroborates the growth projections of NCWorks cited above:

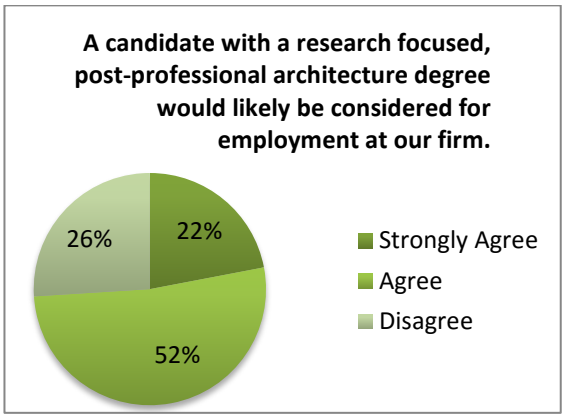
  - Employment in architectural (and related) occupations is projected to increase by 3% and by approximately 67,200 new jobs between the years of 2014 and 2024 (http://www.bls.gov/ooh/architecture-and-engineering/home.htm).

  While this growth rate is somewhat slower than that of all occupations overall, the transitions from traditional drafting (for example) to more complex technologies such as

design and computational software, point to the importance of degrees such as our proposed Master of Science (M.S.) in Architecture.

- Projections from professional associations or industry reports.
  From October of 2010 to January of 2011, 44 large regional and national architecture firms were polled for their reception of the proposed research-based master's degree; twenty-three responses were received. The responses were overwhelmingly positive:

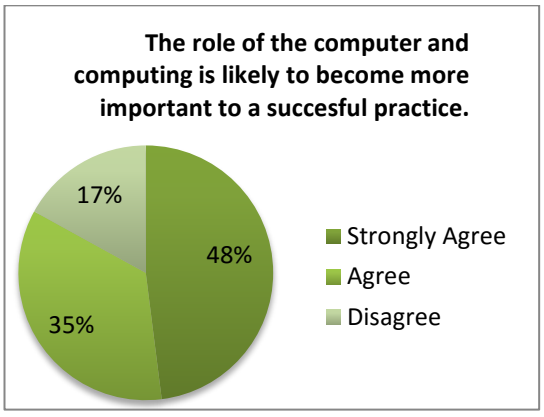


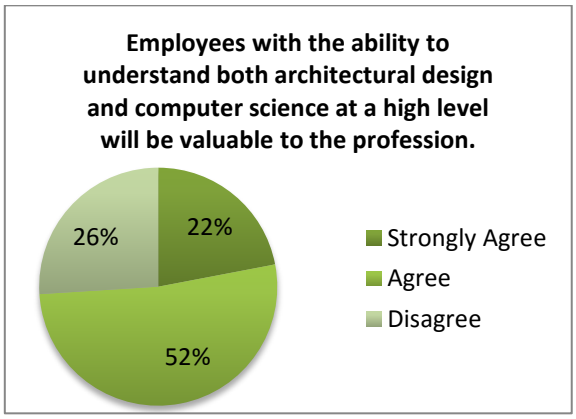


As the charts above indicate, respondents see research skills as valuable assets that future employees will need. In the words of one respondent:

"To me this program will better prepare students for the ever changing, dynamic field of design and architecture. It will create an opportunity for students to develop and research new and appropriate design methodologies that in my opinion are greatly needed. Furthermore, this program will enable students to address the growing demand from clients that we measure the impact of remarkable design beyond esthetics. I appreciate that UNCC is thinking about the future and preparing students to make that measurable impact."

Regarding Design Computation specifically, the survey responses were also positive:





When surveyed (2010-11) specifically about the merits of a Master of Science (M.S.) in Architecture with concentrations in Design Computation and/or Performance Diagnostics, architectural and engineering professionals noted that "architecture has needed this model of research degree for some time" and it "is clearly a worthwhile and meaningful pursuit that will benefit the profession as a whole". One survey respondent reported that their firm had hired two recent UNC Charlotte architecture students specifically because of their diagnostics experience and its applicability to high performance building design.

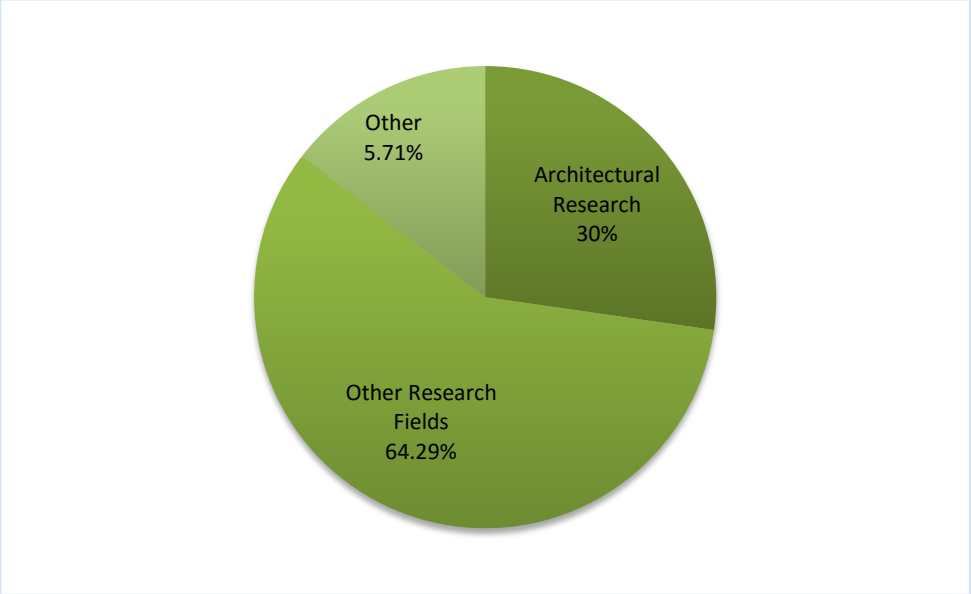
We continue to see interest in research expertise and skills from design professionals. Chris Jarrett, the Director of UNC Charlotte's School of Architecture (SoA), recently spoke with a group of professionals at the 2016 AIA South Atlantic Region Conference in Savannah, GA (Sept. 29 to Oct. 1, 2016) all of whom work in medium-sized to large-size architecture firms. There was a unanimous consensus that advanced architectural research in the context of a focused, non-professional program of study (through an M.S. in Architecture) would be advantageous to the profession and to prospective employees entering a competitive marketplace. The architects all mentioned that the profession is diversifying and expanding, with both architects and clients requiring increasing specialization and expertise in areas such as sustainability, innovative architectural technology, computation design, program specialization, and project delivery. The need for graduates from schools of architecture with a specialized course of study that addresses research skills not covered by the professional accredited B.Arch. or M.Arch. is growing.

- Alumni Survey

  In December 2014, an online survey of UNC Charlotte SoA alumni was conducted to gauge interest in post professional degree programs. The survey received 128 responses, approximately 59% of alumni respondents are currently working in the state of North Carolina (see chart below). That survey captured responses from alumni who received a Bachelor of Arts in Architecture degree (57.81%), Bachelor of Architecture (44.53%), Master of Architecture (18.76%), and Master of Urban Design (1.56%); the majority of respondents received their degree prior to 2012 (87.50%).[8] This survey is valuable in highlighting where our current alumni are working (in state or elsewhere) and highlighting the interest that working professionals may have in non-professional degree offerings. UNC Charlotte has been graduating Bachelors of Architecture students since 1976. A recent search of the School's alumni base contains 2,066 Architecture alumni of which 1,269 remain in North Carolina; of these, 647 are in Mecklenburg County while 825 are in surrounding counties. Many of these alumni will be reaching career transitions and may be interested in enrolling in the proposed non-professional program.

[8] These figures reflect the fact that many respondents may have received multiple degrees. For example, it is common for B.Arts recipients to continue their studies and acquire an M. Arch. or a combination of graduate degrees such as the dual Master of Architecture and Urban Design.

Alumni Interested in Non-Professional Degree Paths



For example, that 2014 survey indicated that nearly 30% of respondents would consider specializing within the field in the future by completing a research-focused, non-professional Master of Science (M.S.) in Architecture. Additionally, of the respondents who indicated that they were pursuing graduate studies at the time of the survey, 64.29% stated that they were pursing degrees in other fields. This points to the interest of our alumni in academic experiences that go beyond the curriculum of the accredited degree program.

According to DesignIntelligence's *Best Architecture Schools 2015* report, 19.5% of students with a professional accredited Bachelor or Master in Architecture degree will pursue an advanced non-professional degree, such as the proposed M.S. in Architecture. Accredited degrees in architecture are a requirement for professional licensure, as is an internship period following graduation. An added advantage for architectural interns to return to school for a non-professional M.S. in Architecture is offered by the National Council of Architecture Registration Boards (NCARB). NCARB, which sets national licensing standards for architects, allows the hours needed for advanced degree course work to be used to shorten the time before taking the Architect Registration Exam (ARE). Therefore, academic study leading to an M.S. in Architecture can contribute towards both licensing and internship requirements and greater marketability for prospective employees.

The 2014 alumni survey also provided useful information on salaries and employment. This data aligned with other national data supporting the conclusion that additional research expertise will likely make our future alumni more competitive in an increasingly complex marketplace. The proposed M.S. in Architecture will thus provide competitive advantages for our future alumni both in terms of their abilities to gain employment but also in terms of their starting salaries and potential for advancement.

When we first began to consider this new program proposal in November 2014, the website of the Charlotte Chapter of the American Institute of Architects (AIA Charlotte) included twenty Charlotte-area jobs in architecture posted within the preceding six weeks. In September 2016, there are seventeen Charlotte-area jobs in architecture posted within the preceding four weeks.

Similarly, the AIA's Career Center listed over 90 local area job openings in June of 2016. According to the AIA Career Center, which includes offerings across the country, over 320 jobs were posted within the month of June 2016. On the job board of the website Archinet, one of the most visited architectural sites in the world, approximately 150 jobs are posted each month; several of these seek architecturally trained employees with a range of research and computational skills (see the approved Request to Plan).

According to the Association for Computer Aided Design in Architecture (ACADIA), in 2014-15 there were ten open faculty searches in North America for Schools of Architecture seeking candidates specifically with research expertise in digital computation. As recently as August of 2016, ACADIA listed an opening for a Digital Director at a UNC institution, which would fit well with the skills of a graduate of our proposed M.S. in Architecture (see the approved Request to Plan). These sources indicate that there is a market for candidates who hold a non-professional M.S. in Architecture and with expertise in computation.

B. Admission. List the following:

1. Admissions requirements for proposed program (indicate minimum requirements and general requirements).

   Master of Science in Architecture applicants must identify a potential research focus to be articulated as a part of their application in the Statement of Purpose. In addition to identifying a potential research focus, admission will be based on an applicant's previous academic credentials, GRE scores, TOEFL scores (for international students), and a portfolio of material illustrative of the applicant's research interests such as reports, writing samples, computational models, etc.).

   The minimum admission requirements for the M.S. in Architecture at UNC Charlotte are:

   - An earned bachelor's degree from a regionally accredited college or university;
   - An overall undergraduate grade point average of at least a 3.0 (based on a 4.0 scale);
     - SoA UNC Charlotte B.Arch or M.Arch degree holders with a 3.5 GPA or above are eligible to be considered for admission to the M.S. in Architecture by submitting the Graduate School application and Statement of Purpose.

- A minimum TOEFL score of 220 (computer-based), 557 (paper-based), or 83 (internet-based) or a minimum IELTS band score of 6.5 required from any applicant whose native language is not English;
- Satisfactory scores on the GRE or GMAT.

The above admission requirements include the minimum admission standards for the UNC Charlotte Graduate School.

2. Documents to be submitted for admission (listing).

Application to the proposed Master of Science in Architecture will follow existing Graduate School and School of Architecture (SoA) admissions processes. The UNC Charlotte application process is completely online.

To apply for graduate studies in the SoA, all applicants must submit the following application materials to the UNC Charlotte Office of Graduate Admissions:

- Graduate School Application for Admission (online)
- Application Fee (payable online)
- Unofficial transcripts from all previous college-level institution(s) attended (submitted online)
- Official TOEFL scores
    - A minimum TOEFL score of 220 (computer-based), 557 (paper-based), or 83 (internet-based) or a minimum IELTS band score of 6.5 required from any applicant whose native language is not English.
- A statement of purpose (essay indicating research interest and potential faculty advisor) submitted online as part of the application submission process
- Three recommendations (submitted online by recommenders)
- Official GRE or GMAT scores
- A resume (submitted online)
- Digital Portfolio (20-page pdf document submitted online; this portfolio may include samples of writing, research, computation, and/or design-based projects)
    - SoA UNC Charlotte B.Arch or M.Arch degree holders with a 3.5 GPA or above are eligible to be recommended for automatic admission to the SoA and are not required to submit separate application materials such as a portfolio.

C. Degree requirements. List the following:

1. Total hours required. State requirements for Major, Minor, General Education, etc.

The M.S. in Architecture will require a minimum of 30 credit hours of study inclusive of a 21 credit hour “core” and 9 credit “concentration.”

2. Other requirements (e.g. residence, comprehensive exams, thesis, dissertation, clinical or field experience, "second major," etc.).

A capstone project* will be required of all Master of Science in Architecture degree candidates; there will be two options to be determined by the student’s advisor and Graduate Program Director:

- Coursework with Project and Written Report
- Coursework with Research and Master’s Thesis

*All students will enroll in ARCH 7213 Thesis and each student will then pursue either a research-based Master’s thesis or a capstone project with report.

For graduate programs only, please also answer the following:

3. Proportion of required program courses open only to graduate students

21 credits of the required program will be open only to graduate students.

ARCH 5611 Research Methods I (3 credits)
ARCH 7210 Ideas Pro-Seminar (3 credits)
ARCH 6890 Directed Independent Study (1 credit)
ARCH 7213 Capstone Project/Thesis (6 credits)
ARCH 7211 Studio Lab I (4 credits)
ARCH 7212 Studio Lab II (4 credits)

4. Grades required

Students in the Master of Science in Architecture program will be expected to earn an A or a B in all courses included in the curriculum and must maintain a minimum cumulative 3.0 GPA (on a 4.0 scale).

As per UNC Charlotte Graduate School Master’s Degree Requirements, students must maintain “an overall GPA of 3.0 or above in courses on the degree plan of study. No more than six hours evaluated as C may be counted toward the minimum hours required for the master's degree.” An accumulation of three C letter grades will result in the suspension of a student’s enrollment in the program.

5. Amount of transfer credit accepted

Due to the unique nature and short duration of the program, the Master of Science in Architecture will not accept transfer credit.

6. Language and/or research requirements

English language proficiency is required. The Master of Science in Architecture will comply with established UNC Charlotte Graduate Admissions English Language Proficiency Requirements and Policies: https://gradadmissions.uncc.edu/admissions-info/international-applicants/english-language-proficiency/

These include a Test of English as a Foreign Language (TOEFL) minimum score of 557 (paper-based) or 83 (internet-based) or International English Language Testing System (IELTS) minimum overall band score of 6.5.

As per UNC Charlotte Graduate Admissions policy, "Applicants who do not meet the minimum English language proficiency requirement will not be admitted to UNC Charlotte. They may, however, choose to enroll at UNC Charlotte's English Language Training Institute (ELTI) and then re-apply to the Graduate School. See ELTI's website for details."

7. Any time limits for completion

The Master of Science in Architecture degree program is designed as an intensive 30 credit hour program requiring full time enrollment over 12 months. Students will be required to complete the course of study within a six-year period as per UNC Charlotte Graduate School policies. Courses that exceed this time limit must be retaken or revalidated. Time limits are described in the UNC Charlotte Graduate Catalog:

"No course older than six years may be applied towards a master's degree (including transfer credit). This policy is in place because of the University's interest in a degree being current when it is awarded. Courses that exceed this time limit must be revalidated or retaken, whichever the graduate program decides necessary, if they are to count in a degree program."

See:
https://catalog.uncc.edu/content.php?catoid=19&navoid=1119#Master's_Degree_Requirements

D. For all programs, list existing courses by title and number and indicate (*) those that are required. Include an explanation of numbering system. List (under a heading marked "new") and describe new courses proposed.

The proposed Master of Science (M.S.) in Architecture will utilize existing coursework and include 21 credits of "core" and 9 credits of "concentration" coursework.

The following existing courses support the proposed Master of Science in Architecture:

*Core (required) courses: 21 credits:

ARCH 5611 Research Methods I (3 credits)

ARCH 7210 Ideas Pro-Seminar (3 credits)
ARCH 6890 Directed Independent Study (1 credit)
ARCH 7213 Capstone Project/Thesis (6 credits)
ARCH 7211 **Studio Lab I (4 credits)
ARCH 7212 **Studio Lab II (4 credits)

***Studio lab sections to be determined in consultation with SoA Academic Advisors.*

Concentration (elective) courses: 9 credits:
Concentration electives to be determined in consultation with SoA Academic Advisors.

Digital Technologies + Material Systems Concentration—9 credits selected from the following:

ARCH 5201 Digital Theory (3 credits)
ARCH 5606 Scripting (3 credits)
ARCH 5607 Digital Fabrication (3 credits)
ARCH 5612 Research Methods II (3 credits)
ARCH 6050 Composites Design (3 credits)
ARCH 6306 Qualitative Robotics (3 credits)

Design Science + Building Systems Concentration—9 credits:

ARCH 6050 Sustainable Façade Design (3 credits)
ARCH 6306 Eco-Responsive Next Generation Facades (3 credits)
ARCH 6307 Technology Topics: Daylighting I (3 credits)

The existing courses listed above follow UNC Charlotte's Academic Policy: Course Numbering and Status (http://provost.uncc.edu/policies/course-numbering-status):

"5000-5999 Graduate Courses with Parallel Undergraduate Courses Listed at the 4000 Level: Not open to undergraduate students. The 5000 level can also be used for courses in programs such as MAT, where the students' undergraduate degrees are in another field and the course content is not at a "higher" level than advanced undergraduate courses in the same discipline. May include parallel undergraduate courses cross-listed at the 4000 level."

"6000-7999 Master's Level Courses: Advanced, well-qualified undergraduates may register in 6000-level courses for undergraduate credit, but only by special request. Thesis registration is generally at the 6900 level with work beyond program requirements numbered GRAD 7999 once all program requirements have been met."

II. Faculty

A. (For undergraduate and master's programs) List the names, ranks and home department of faculty members who will be directly involved in the proposed program. The official roster forms approved by SACSCOC may be submitted. For master's programs, state or

attach the criteria that faculty must meet in order to be eligible to teach graduate level courses at your institution.

Faculty Name (Architecture)	Title	Specialization	Degree
Mona Azarbayjani	Associate Professor	Architecture Design Science & Building Technology	Ph.D. in Architecture, University of Illinois at Urbana-Champaign
Chris Beorkrem	Associate Professor	Architecture Design & Computation Co-Director of Digital Arts Center	Master of Science in Advanced Architectural Design, Columbia University
Dale Brentrup	Professor	Architecture Design Science & Building Technology Director of Integrated Design Research Labs	Master of Architecture, University of California, Los Angeles (1982); post-graduate research associate at the University of California, Berkeley.
Charles Davis II	Associate Professor	Architectural History, Theory and Criticism	Ph.D. in Architecture, University of Pennsylvania
Rachel Dickey	Assistant Professor	Computational Design, Technology & Robotics	Master of Design Studies, Graduate School of Design - Harvard University; Master of Architecture, Georgia Institute of Technology
Jefferson Ellinger	Associate Professor	Computational Design and Composites	Master of Architecture, Columbia University
Kyoung-Hee Kim	Associate Professor	Design Science & Building Technology	Ph.D. in Architecture, Master of Architecture, University of Michigan; Master of Engineering in Architecture, Chonbuk National University, Chonju, Korea
Eric Sauda	Professor	Computational Design & Visualization	Master of Architecture, University of California-Los Angeles
Peter Wong	Associate Professor	Architectural Design & Theory; Graduate Program Director	Master of Architecture, University of Pennsylvania

At a minimum, a Master of Architecture (terminal, professional) degree or a Master of Science in Computer Science or Software Information Systems is required to qualify to teach in this program.

B. (For doctoral programs) List the names, ranks, and home department of each faculty member who will be directly involved in the proposed program. The official roster forms approved by SACSCOC may be submitted. Provide complete information on each faculty member's education, teaching and research experience, research funding, publications, and experience directing student research including the number of theses and dissertations directed.

N/A

C. Estimate the need for new faculty for the proposed program over the first four years. If the teaching responsibilities for the proposed program will be absorbed in part or in whole by the present faculty, explain how this will be done without weakening existing programs.

The School of Architecture (SoA) at UNC Charlotte is currently in the process of hiring an additional faculty member who will support the proposed Master of Science in Architecture. This new hire follows an appointment made in Design Computation in the spring of 2016 (R. Dickey).

The proposed M. S. in Architecture within the SoA will contribute to the overall enrollment goals of the College of Arts + Architecture (CoA+A). As of fall 2016, the SoA had 105 graduate students in several degree paths (M.Arch I, M.Arch. II., M.U.D.); our current enrollment puts the overall growth projections in CoA+A within reach (low range of 111). The SoA has already added faculty in recent years who can support the increase in student population over the next 4 years due to the proposed M.S. in Architecture.

D. Explain how the program will affect faculty activity, including course load, public service activity, and scholarly research.

The Master of Science in Architecture will not have a significant impact upon faculty course load or service. The current M.Arch. Track III degree path in the SoA will become the non-professional M.S. in Architecture, thus the courses faculty currently teach in this area will serve the proposed M.S. program.

The current M.Arch. Track III degree path has been a source of high productivity for faculty and student research, which has led to numerous external grant-funded research initiatives:

- $1,100,000 for the US Dept. of Energy Solar Decathlon, 2013 (Federal Funding: $100,000; Industry Funding: $500,000; State Funding: $300,000; Donations: $200,000).
- $125,000 in The State and Industry (Autodesk) funding for a new Robotics Lab, 2015.
- $350,000 in Federal ($150,000) and Industry ($250,000) funding for research focused on Sustainably Integrated Buildings and Sites, 2013-16.
- $251,500 in Industry gifts (Autodesk, Inc.), funding (Multivariate Design Strategies for Conceptual Design, Internet of Things, Project Fractal) 2015-17.

In addition to a range of externally funding research initiatives, faculty have also been active through scholarly publications:

- Beorkrem, Chris, Material Strategies for Digital Fabrication, Routledge Press, Second Edition, 2017.
- Beorkrem, Chris, Book Chapter, *Critical Approaches to Contemporary Architecture,* Editors: Swati Chattopadhyay and Jeremy White, Routledge

Publishing, 2016.

- Beorkrem,Chris, Jefferson Ellinger, Phil Bernstein, Anthony Hauck "Multivariate Design Strategies for Conceptual Design" CAADRIA(21st Annual Conference on Computer-Aided Architecture Design Research in Asia)- Melbourne Australia- March, 2016.
- Cho, I., Dou, W., Wang, D. X., Sauda, E., & Ribarsky, W. (2016). VAiRoma: A Visual Analytics System for Making Sense of Places, Times, and Events in Roman History. *Visualization and Computer Graphics, IEEE Transactions on*, *22*(1), 210-219.
- Karduni, Alireza, Amirhassan Kermanshah, and Sybil Derrible. "A protocol to convert spatial polyline data to network formats and applications to world urban road networks." Nature- Scientific Data, 2017.
- Karduni, Alireza, Isaac Cho, Wenwen Dou, William Ribarsky, Ginette Wessel, Eric Sauda. ""Urban Space Explorer: A Visual Analytics System for Understanding Urban Social Media Activities", IEEE Computer Graphics and Applications 2017.
- Sauda, Eric; Beorkrem, Chris; Christiian, Scott; Danchenka, Evan; Hess, Trevor. "Prepared Music Field: Interactive Spatial Music Performances," 2015 Education and Research in Computer Aided Architectural Design in Europe (eCAADe).

This track record establishes a strong foundation for future external grants and projects to support students enrolled in the proposed M.S. program.

III. Delivery Considerations. Provide assurances of the following (not to exceed 250 words per lettered item):

A. *Access* (online, site-based distance education, and off-campus programs). Students have access to academic support services comparable to services provided to on-campus students and appropriate to support the program, including admissions, financial aid, academic advising, delivery of course materials, and placement and counseling.

N/A. The proposed Master of Science in Architecture will be offered 100% on the main campus of UNC Charlotte.

B. Curriculum delivery (online and site-based distance education only). The distance education technology to be used is appropriate to the nature and objectives of the program. The content, methods and technology for each online course provide for adequate interaction between instructor and students and among students.
N/A

C. Faculty development (online and site-based distance education only). Faculty engaged in program delivery receive training appropriate to the distance education technologies and techniques used.
N/A

D. Security (online and site-based distance education only). The institution authenticates and verifies the identity of students and their work to assure academic honesty/integrity.

The institution assures the security of personal/private information of students enrolled in online courses.
N/A

IV. Library

A. Provide a statement as to the adequacy of present library holdings for the proposed program to support the instructional and research needs of this program.

The current library holdings are sufficient to support a Master of Science in Architecture. The university has relevant holdings in both Atkins Library and in the Charles C. Hight Architecture Library. The Architecture Library is the only branch library at the University. The primary focus of the collection is 20th and 21st century design, architects, and the built environment. In addition, the library offers audio-visual equipment for check out to students and faculty in the School of Architecture (SoA).

The library has several relevant electronic resources including the subject databases Avery Index to Architectural Periodicals, Art & Architecture Complete, and Arts & Humanities Databases from ProQuest. Resources specifically related to urban design include SimplyMap, the Sanborn Maps for North Carolina, GeoRef, and Environment Complete. The library also provides access to the image database Artstor, which includes over 450,000 images related to architecture and city planning from a variety of countries. In addition, there are several relevant interdisciplinary databases such as JSTOR and Academic Search Complete.

Table 4 shows relevant books, e-books, and journals offered by the library. If gaps in the collection are identified as the program is implemented, materials may be purchased using library funds allocated to the College of Arts & Architecture (CoA+A). In addition, books or articles that are not held by the library may be requested through interlibrary loan, a free service for students and faculty. Faculty input will be sought when purchasing new titles for the program when needed.

Table 4. Relevant Architecture Terminology & Library Holdings

LC Subject Heading	Print Books	E-Books	Journals	E-Journals (subset of Journals)	Videos
Architecture	10212	2412	533	282	468
Architecture, Modern	1447	45	42	9	159
Architecture, Modern 20th century	1064	35	32	6	34
Architecture, Greek	38	4	0	0	2
Architecture, Roman	101	11	3	2	3
Architecture, Ancient	50	41	0	0	47
Architecture and science	53 (18 in Computer Science; 17 in Architecture)	445 (280 in Computer Science; 19 in Architecture)	0	0	0
Geographic Information Systems	279	461	51	37	0
Regional Planning	1210	532	122	78	3
Regional planning -- Environmental aspects	64	52	0	0	0
Sustainable development	527	510	40	39	20

Sustainable design	90	69	5	5	15
Sustainable architecture	185	119	6	5	26
City planning	3209	714	229	136	39
Urban renewal	620	218	23	10	18

B. If applicable, state how the library will be improved to meet new program requirements for the next four years. The explanation should discuss the need for books, periodicals, reference material, primary source material, etc. What additional library support must be added to areas supporting the proposed program?

Existing library resources are adequate for the Master of Science in Architecture program.

C. Discuss the use of other institutional libraries.

The university's participation in inter-library loan consortium provides another means of effectively supporting research and instructional needs within the SoA and the proposed Master of Science in Architecture program.

V. Facilities and Equipment

A. Describe facilities available for the proposed program.

In addition to the School of Architecture's (SoA) Charles C. Hight Branch Architectural Library, the School has a range of lab spaces that will support the proposed non-professional Master of Science in Architecture program (these labs currently support the professional Master of Architecture degree program). These labs include woods, metal and digital fabrication labs, and a daylighting lab that supports student and faculty teaching and research. These labs overlap with two college-based research centers, which are also central to student learning and faculty research and teaching: Digital Arts (D-Arts), and the Integrated Design Research Laboratory (IDRL).

The Digital Arts Center (D-Arts) focuses on digital methods in architecture, examining new technologies related to fabrication, interactive architecture, and visualization, which increasingly influence architectural design and practice. Through the Center, students network with institutions globally, developing analytic and visualization capacity and collaborating with the profession at a national level. Specialized equipment in the Digital Fabrication Lab includes: 5 Laser Cutters (3 in Storrs / 2 in CCB), 4 Makerbot 3D Printers (2 in Storrs / 2 in CCB), a KUKA KR-60 Robotic Arm with Gripper, router spindle and extruder, a 4' X 8' CNC Plasma Cutter, a 5' X 8' 3-Axis CNC Router, and a 4' X 4' Vacuum Former.

The Integrated Design Research Laboratory (IDRL) is comprised of the Daylighting + Energy Performance Laboratory and the Environmental Systems Testing Laboratory. The labs focus on architectural technologies and building performance issues, particularly related to sustainability, energy use, lighting technology, and material systems development. Courses and research in this area focus on emerging issues of sustainable design and the development of innovative building envelopes and systems that utilize both new and traditional materials, technology, and construction methods. Students can engage projects that explore the historical and contemporary realms of thermal, tactile and visual issues of technology, materiality, daylighting, and passive and active systems with consideration of both qualitative and quantitative outcomes. Specialized equipment in the Daylighting + Energy Performance Laboratory includes: artificial sky, heliodon, performance and analysis computation banks, and simulation software.

B. Describe the effect of this new program on existing facilities and indicate whether they will be adequate, both at the commencement of the program and during the next decade.

Existing facilities are adequate for the commencement of the proposed M.S. in Architecture.

C. Describe information technology and services available for the proposed program.

In addition to the research labs described above, the SoA at UNC Charlotte supports a range of information technology, computation, and digital technology resources (including a full print lab) that support current faculty and student research. These resources will support the proposed Master of Science in Architecture.

The SoA offers several high-end computer lab options to students, faculty and staff. The SoA fully maintains a wide variety of software and hardware that ensures students have all of the necessary resources to engage their work. Most computers have the ability to run either the Windows or Macintosh operating systems. This allows students to run any software necessary, no matter what computer they are using. Whether the need be 3-D modeling, image manipulation, video editing, CAD, GIS, BIM, or high-quality large-format printing, the IT infrastructure in the SoA can support these varied student needs. All of the labs, classrooms, and production facilities are tightly integrated with the curriculum and updated annually to ensure that the SoA is using the latest in digital architectural technology.

- Computers / Internet / Server Access
  The SoA maintains 75 computers that are available to SoA students in computer labs and research centers in Storrs Hall (an additional 120 computer stations host SoA software in the Center City Building). Every studio bay and critique room in Storrs Hall has a 55” digital monitor for presentations, lectures, critiques or other digital media. The internet is available in all studios with both wired and wireless connection. SoA File Server access from off-campus locations is available through VPN. The computer labs are available with 24-7 card access for currently enrolled CoA+A students:

- Storrs 285 (Computer Classroom) 21 PCs - Windows 10
- Storrs 148c (Digital Arts Center) 8 Mac OS X and Windows 10
- Storrs 230 (Computer Lab) 21 Mac OS X and Windows 10
- Large scale scanner and Ricoh printer
- Storrs 200 (Library) 5 Mac OS X and Windows 10
- Storrs: (Digital Fabrication Lab) 1 robotic arm, 3 laser cutters, 1 plasma cutter, 1 CNC router, 4 3D printers, 4 laser cutters, 7 computers integrated with each of the previously listed devices
- Storrs: Daylighting / Energy Lab 15 computers, 1 Heliodon, 1 Artificial Sky

- Print Labs:
  The SoA has a dedicated Print Labs in Storrs Hall and in its studios in UNC Charlotte Center City. The Storrs Hall Print Lab (Rm 222) has 5 plotters, 1 color printer, and 1 gray scale printer, as well as 1 large format scanner and 1 laser Ricoh printer (with Wi-Fi printing capability). The Print Lab is staffed with 10-12 student assistants that are trained and managed by the CoA+A IT department.

  Storrs Print Lab (Storrs 222b):

  - 2- HP DesignJet T7100 Printer (24”-42”)
  - 1 - Canon iPF8300S Large Format Printer (36”-44”)
  - 1- OCE Plotwave 300 Wide Printer (36”) & 1- OCE Colorwave 650 Large Format Printer (36”-42”)
  - 1- Xerox Phaser 7500 Laser Printer (Letter and Tabloid)
  - 1- HP Laserjet 5200 Laser Printer (Letter and Tabloid)
  - 1 - 42” Wide Format Scanner

D. Describe the effect of this new program on existing information technology and services and indicate whether they will be adequate, both at the commencement of the program and during the next decade.

The existing information technology and services within the SoA are adequate for the commencement of the proposed Master of Science in Architecture. As a computationally based research degree program, changes and advances in technology will necessitate continued investment in the information technology and services of the School overall. All of the labs, classrooms, and production facilities are tightly integrated with the SoA’s various curricula and updated annually to ensure that the SoA is using the latest in digital architectural technology. This annual update cycle will address the potential changing needs of the M.S. in Architecture.

VI. Administration

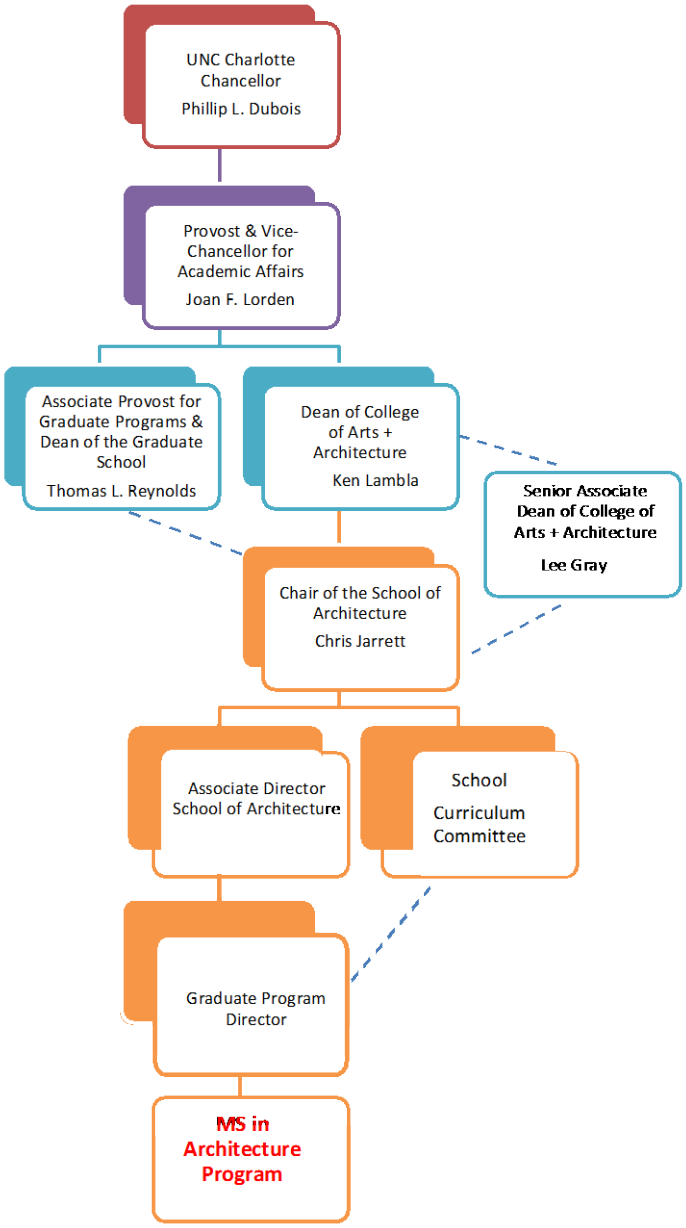
A. Describe how the proposed program will be administered, giving the responsibilities of each department, division, school, or college. Explain any inter-departmental or inter-unit administrative plans. Include an organizational chart showing the "location" of the proposed new program.

The proposed Master of Science in Architecture degree program will be administered within the School of Architecture (SoA), part of the College of Arts + Architecture (CoA+A), as illustrated by the SoA Organizational Chart below. The School has a Graduate Program Director who will assist in the advising, recruitment and oversight of graduate students within the M.S. in Architecture Program (the Associate Director of the SoA will assist with advising as well). The Graduate Program Director will report to the Associate Director who reports to the Director of the SoA. The Director of the SoA has ultimate responsibility for all programs within the School. The Director of the SoA reports to the Dean of CoA+A and consults with the Senior Associate Dean for Academic Affairs in CoA+A. The Dean of CoA+A reports to the Provost.

At the University of North Carolina at Charlotte, the Dean of the Graduate School is the administrative officer with primary responsibility for the supervision of graduate programs. The Dean is responsible for the executive and administrative affairs of the Graduate School in accordance with policies determined by the UNC Charlotte Graduate Council, the Graduate Faculty, and the Faculty Council. The Graduate School is responsible for monitoring the quality of graduate programs, the final admission of graduate students, appointments to the Graduate Faculty, and the enhancement of research activities essential to the conduct of graduate programs. The Dean of the Graduate School's main duties include the following:

- Admission of students
- Appointment of dissertation and thesis committees
- Approval of programs of study
- Admission of students to candidacy
- Final approval of theses and dissertations

The following chart depicts the organizational "location" of the proposed Master of Science in Architecture program:



School of Architecture Organizational Chart: Master of Science in Architecture

B. For joint programs only, include documentation that, at minimum, the fundamental elements of the following institutional processes have been agreed to by the partners:
   1. Admission process
   2. Registration and enrollment process for students
   3. Committee process for graduate students
   4. Plan for charging and distributing tuition and fees
   5. Management of transcripts and permanent records
   6. Participation in graduation
   7. Design of diploma

   N/A

VII. Accreditation and Licensure

A. Where appropriate, describe how all licensure or professional accreditation standards will be met, including required practica, internships, and supervised clinical experiences.

The proposed Master of Science in Architecture will be a non-professional and non-NAAB (National Architectural Accreditation Board) accredited degree program.

The M.S. in Architecture will be a research-focused degree that will not overlap with current criteria required of accredited professional architectural degree programs, including the nationally-accredited Master of Architecture offered at UNC Charlotte.

While the M.S. in Architecture will be a non-professional and non-accredited degree, the School of Architecture (SoA) will review and assess the M.S. program on a regular cycle that will coincide with the SoA's required National Architectural Accrediting Board visits. Visiting NAAB Review Teams will be asked to consider the curriculum and output of the M.S. in Architecture as they review the SoA's Master of Architecture program. Advice and suggestions made by visiting accrediting teams will be used to help revise and maintain the M.S. in Architecture program.

B. Indicate the names of all accrediting agencies normally concerned with programs similar to the one proposed. Describe plans to request professional accreditation.

N/A

C. If the new degree program meets the SACSCOC definition for a substantive change, what campus actions need to be completed by what date in order to ensure that the substantive change is reported to SACSCOC on time?

The UNC Charlotte Office of Assessment and Accreditation has stated that: "Since the degree is built using existing courses from an approved program, this is not a SACSCOC substantive change" (Feb. 28, 2017).

D. If recipients of the proposed degree will require licensure to practice, explain how program curricula and title are aligned with requirements to "sit" for the licensure exam.

N/A; the Master of Science in Architecture will be a non-professional degree (meaning that no license will be needed to practice in research areas associated with architecture).

VIII. Supporting Fields. Discuss the number and quality of lower-level and cognate programs for supporting the proposed degree program. Are other subject-matter fields at the proposing institution necessary or valuable in support of the proposed program? Is there needed improvement or expansion of these fields? To what extent will such improvement or expansion be necessary for the proposed program?

None is needed.

X. Budget

A. Complete and insert the Excel budget template provided showing incremental continuing and one-time costs required each year of the first four years of the program. Supplement the template with a budget narrative for each year.

The Master of Science in Architecture will not have a significant impact upon faculty course load or service. The current M.Arch. Track III degree path in the School of Architecture (SoA) will become one of the concentrations in the new non-professional M.S. in Architecture; the courses faculty currently teach in this area will serve the proposed Digital Technologies + Materials Systems Concentration in the new M.S. program. Other existing coursework will form the basis for a Design Science + Building Systems Concentration. In addition, the SoA has hired one faculty member to support the proposed M.S. in Architecture degree program in the Digital Technologies concentration (spring 2016); an additional hire with expertise in this concentration will be hired this year (spring 2017) and we anticipate forthcoming hires to support proposed concentrations in Design Science (spring 2018). Additionally, the Graduate School at UNC Charlotte supports the SoA's research initiatives through recurring funds for graduate research assistantships ($36,000). Therefore, we anticipate that our faculty, staff, resources, and curricula are adequate to support launching the proposed M.S. in Architecture.

The following Budget Template illustrates how existing funding will support the new M.S. in Architecture.

SUMMARY OF ESTIMATED ADDITIONAL COSTS FOR PROPOSED PROGRAM					
INSTITUTION	UNC Charlotte		DATE	3-May-17	
Program (CIP, Name, Level)	.0902 Master of Science in Architectu				
Degree(s) to be Granted	MS ARCH		Program Year	Year 1 (2018-2019)	
Differential tuition requested per student per academic yr		$1,750			
Projected annual FTE students		7			
Projected annual differential tuition		$12,250			
Percent differential tuition for financial aid					
Differential tuition remainder		12250			
	ADDITIONAL FUNDS REQUIRED - BY SOURCE				
	Reallocation of Present Institutional Resources	Projected Differential Tuition	Enrollment Increase Funds	Other New Allocations (Identify)	Total
EPA/SPA Regular Salaries					
(N/A)	$ -	$ -	$ -	$ -	$ -
EPA Academic Stipend					
Program Coordinator	$ 7,500.00	$ -	$ -	$ -	$ 7,500.00
Social Security	$ -	$ -	$ -	$ -	$ -
State Retirement	$ -	$ -	$ -	$ -	$ -
Medical Insurance	$ -	$ -	$ -	$ -	$ -
Graduate Stipends					
5 @ 9000	$ 36,000.00	$ 9,000.00	$ -	$ -	$ 45,000.00
Funded by the Graduate School UNC Charlote and Tuition Increment					
Supplies and Materials					
(N/A)	$ -	$ -	$ -	$ -	$ -
Current Services					
(N/A)	$ -	$ -	$ -	$ -	$ -
Travel (N/A)	$ -	$ -	$ -	$ -	$ -
Communications (N/A)	$ -	$ -	$ -	$ -	$ -
Printing and Binding (N/A)	$ -	$ -	$ -	$ -	$ -
Advertising	$ -	$ 3,500.00	$ -	$ -	$ 3,500.00
Fixed Charges					
(N/A)	$ -	$ -	$ -	$ -	$ -
Capital Outlay (Equipment)					
(N/A)	$ -	$ -	$ -	$ -	$ -
Libraries (N/A)	$ -	$ -	$ -	$ -	$ -
TOTAL ADDITIONAL COSTS	**$ 43,500.00**	**$ 12,500.00**	**$ -**	**$ -**	**$ 56,000.00**
Narrative:					
Narrative: A program director is currently in place supporting the M.Arch. Track III.					
This existing program director will become the program director for the proposed M.S. in Architecture.					
No new hires will be needed in the first year.					
The existing tuition increment will provide one graduate assistantship and recruitment support.					

SUMMARY OF ESTIMATED ADDITIONAL COSTS FOR PROPOSED PROGRAM					
INSTITUTION	UNC Charlotte		DATE	3-May-17	
Program (CIP, Name, Level)	.0902 Master of Science in Architectu				
Degree(s) to be Granted	MS ARCH		Program Year	Year 2 (2019-2020)	
Differential tuition requested per student per academic yr		$1,750			
Projected annual FTE students		10			
Projected annual differential tuition		$17,500			
Percent differential tuition for financial aid					
Differential tuition remainder		17500			
	ADDITIONAL FUNDS REQUIRED - BY SOURCE				
	Reallocation of Present Institutional Resources	Projected Differential Tuition	Enrollment Increase Funds	Other New Allocations (Identify)	Total
EPA/SPA Regular Salaries					
(N/A)	$ -	$ -	$ -	$ -	$ -
EPA Academic Stipend					
Program Coordinator		$ -	$ 7,500.00	$ -	$ 7,500.00
Social Security	$ -	$ -	$ -	$ -	$ -
State Retirement	$ -	$ -	$ -	$ -	$ -
Medical Insurance	$ -	$ -	$ -	$ -	$ -
Graduate Stipends					
5 @ 9000	$ 36,000.00	$ 9,000.00	$ 18,000.00	$ -	$ 63,000.00
Funded by the Graduate School UNC Charlote and Tuition Increment					
Supplies and Materials					
Software upgrades for labs	$ -	$ 5,000.00	$ 10,000.00	$ -	$ 15,000.00
Current Services					
(N/A)	$ -	$ -	$ -	$ -	$ -
Travel (N/A)	$ -	$ -	$ -	$ -	$ -
Communications (N/A)	$ -	$ -	$ -	$ -	$ -
Printing and Binding (N/A)	$ -	$ -	$ -	$ -	$ -
Advertising	$ -	$ 3,500.00	$ 10,000.00	$ -	$ 13,500.00
Fixed Charges					
(N/A)	$ -	$ -	$ -	$ -	$ -
Capital Outlay (Equipment)					
Equipment Upgrades for labs	$ -	$ -	$ 35,000.00	$ -	$ 35,000.00
Libraries (N/A)	$ -	$ -	$ -	$ -	$ -
TOTAL ADDITIONAL COSTS	**$ 36,000.00**	**$ 17,500.00**	**$ 80,500.00**	**$ -**	**$ 134,000.00**
Narrative:					
Narrative: In year 2, one graduate assistantship, recruitment costs and lab upgrades will be charged against the tuition increment. Software upgrades for the labs and on-going recruitment efforts will also be charged against the increment. Program Coordinator, lab and equipment upgrades, and recruitment will be charged against Enrollment Increase funds. No new hires will be needed in the second year.					

SUMMARY OF ESTIMATED ADDITIONAL COSTS FOR PROPOSED PROGRAM					
INSTITUTION	UNC Charlotte		DATE	3-May-17	
Program (CIP, Name, Level)	.0902 Master of Science in Architectu				
Degree(s) to be Granted	MS ARCH		Program Year	Year 3 (2020-2021)	
Differential tuition requested per student per academic yr		$1,750			
Projected annual FTE students		12			
Projected annual differential tuition		$21,000			
Percent differential tuition for financial aid					
Differential tuition remainder		21000			
	ADDITIONAL FUNDS REQUIRED - BY SOURCE				
	Reallocation of Present Institutional Resources	Projected Differential Tuition	Enrollment Increase Funds	Other New Allocations (Identify)	Total
EPA/SPA Regular Salaries					
(N/A)	$ -	$ -	$ -	$ -	$ -
EPA Academic Stipend					
Program Coordinator		$ -	$ 7,500.00	$ -	$ 7,500.00
Social Security	$ -	$ -	$ -	$ -	$ -
State Retirement	$ -	$ -	$ -	$ -	$ -
Medical Insurance	$ -	$ -	$ -	$ -	$ -
Graduate Stipends					
5 @ 9000	$ 36,000.00	$ 9,000.00	$ 18,000.00	$ -	$ 63,000.00
Funded by the Graduate School UNC Charlote and Tuition Increment					
Supplies and Materials					
Software upgrades for labs	$ -	$ 5,000.00	$ 10,000.00	$ -	$ 15,000.00
Current Services					
(N/A)	$ -	$ -	$ -	$ -	$ -
Travel	$ -	$ -	$ 8,500.00	$ -	$ 8,500.00
Communications (N/A)	$ -	$ -	$ -	$ -	$ -
Printing and Binding (N/A)	$ -	$ -	$ -	$ -	$ -
Advertising	$ -	$ 3,500.00	$ 10,000.00	$ -	$ 13,500.00
Fixed Charges					
(N/A)	$ -	$ -	$ -	$ -	$ -
Capital Outlay (Equipment)					
Equipment Upgrades for labs	$ -	$ -		$ -	$ -
Libraries (N/A)	$ -	$ -	$ -	$ -	$ -
TOTAL ADDITIONAL COSTS	**$ 36,000.00**	**$ 17,500.00**	**$ 54,000.00**	**$ -**	**$ 107,500.00**
Narrative:					
Narrative: In year 3, one graduate assistantship, recruitment costs and lab upgrades will be charged against the					
tuition increment. Software upgrades for the labs and on-going recruitment efforts will also be charged against the increment.					
Program Coordinator, advertising and recruitment travel will be charged against Enrollment Increase funds.					
No new hires will be needed in the third year.					

SUMMARY OF ESTIMATED ADDITIONAL COSTS FOR PROPOSED PROGRAM					
INSTITUTION	UNC Charlotte		DATE	3-May-17	
Program (CIP, Name, Level)	.0902 Master of Science in Architectu				
Degree(s) to be Granted	MS ARCH		Program Year	Year 4 (2020-2021)	
Differential tuition requested per student per academic yr		$1,750			
Projected annual FTE students		12			
Projected annual differential tuition		$21,000			
Percent differential tuition for financial aid					
Differential tuition remainder		21000			
	ADDITIONAL FUNDS REQUIRED - BY SOURCE				
	Reallocation of Present Institutional Resources	Projected Differential Tuition	Enrollment Increase Funds	Other New Allocations (Identify)	Total
EPA/SPA Regular Salaries					
(N/A)	$ -	$ -	$ -	$ -	$ -
EPA Academic Stipend					
Program Coordinator	$ 7,500.00	$ -	$ -	$ -	$ 7,500.00
Social Security	$ -	$ -	$ -	$ -	$ -
State Retirement	$ -	$ -	$ -	$ -	$ -
Medical Insurance	$ -	$ -	$ -	$ -	$ -
Graduate Stipends					
5 @ 9000	$ 36,000.00	$ 9,000.00	$ -	$ -	$ 45,000.00
Funded by the Graduate School UNC Charlote and Tuition Increment					
Supplies and Materials					
(N/A)	$ -	$ -	$ -	$ -	$ -
Current Services					
(N/A)	$ -	$ -	$ -	$ -	$ -
Travel (N/A)	$ -	$ -	$ -	$ -	$ -
Communications (N/A)	$ -	$ -	$ -	$ -	$ -
Printing and Binding (N/A)	$ -	$ -	$ -	$ -	$ -
Advertising	$ -	$ 2,000.00	$ -	$ -	$ 2,000.00
Fixed Charges					
(N/A)	$ -	$ -	$ -	$ -	$ -
Capital Outlay (Equipment)					
Lab equipment upgrades	$ -	$ 10,000.00	$ -	$ -	$ 10,000.00
Libraries (N/A)	$ -	$ -	$ -	$ -	$ -
TOTAL ADDITIONAL COSTS	**$ 43,500.00**	**$ 21,000.00**	**$ -**	**$ -**	**$ 64,500.00**
Narrative:					
By year 4, the M.S. in Architecture will continue at full enrollment.					
One graduate assistantship, recruitment costs and lab up-grades will be charged against the tuition increment.					
No new hires will be needed in the third year.					

B. Based on the campus' estimate of available existing resources or expected non-state financial resources that will support the proposed program (e.g., federal support, private sources, tuition revenue, etc.), will the campus:

1. Seek enrollment increase funds or other additional state appropriations (both one-time and recurring) to implement and sustain the proposed program? If so, please elaborate.

   We will seek enrollment increase funds to support the program beginning in Year 2. As the program grows, these funds will be used support the program coordinator, graduate student support (research and travel scholarships) and specialized materials (lab maintenance and upgrades) for the program. We do not anticipate federal support for the MS degree, however, an increase in tenure-track faculty (recent hires in AY 2015-16 and 2016-17) that will support the M.S. in Architecture degree will result in an increase in federal grant applications for research in digital technologies, computation, material systems, and design sciences.

2. Require differential tuition supplements or program-specific fees? If so, please elaborate.
   a. State the amount of tuition differential or program-specific fees that will be requested.

      The SoA currently applies a (previously approved) tuition increment of $875.00 per semester to each of its graduate degree programs (Master of Architecture I, II, III and Master of Urban Design). This tuition increment will also apply to the proposed Master of Science in Architecture.

   b. Describe specifically how the campus will spend the revenues generated.

      The tuition increment helps cover the costs of the purchase and maintenance of the specialized equipment, hardware, and software in the SoA research labs, printing and computer labs, and metal, wood, and digital fabrication labs. A portion of these funds are used to enhance classroom technology and to expand the resources available to students. This includes the expansion of our wireless environment, acquisition and maintenance of state-of-the-art digital tools and equipment, architectural software licenses, and improvements in online platforms and video-conference equipment. This increment also helps support graduate student research staff in the Digital Arts Center (D-Arts) and Integrated Design Research Lab (IDRL).

      The tuition increment also provides expanded student services and professional development. Student services include enhanced orientation programs, a regular speaker series, networking events, and educational programs conducted jointly with the profession. Twenty-five percent (25%) of the tuition increment is used for research assistantships.

The tuition increment also enhances faculty development. A portion of the increment provides competitive faculty development and curriculum "grants." These grants support faculty activities that directly engage students, curriculum development, and applied research.

c. Does the campus request the tuition differential or program-specific fees be approved by the Board of Governors prior to the next Tuition and Fee cycle?

No. A Tuition Increment for graduate degree programs in the SoA has already been approved. We will request the SBTI extend to the new program.

C. If enrollment increase funding, differential tuition, or other state appropriations noted in the budget templates are not forthcoming, can the program still be implemented and sustained and, if so, how will that be accomplished? Letters of commitment from the Chancellor and/or Chief Academic Officer should be provided.

Please see attached letter of commitment.

IX. Additional Information. Include any additional information deemed pertinent to the review of this new degree program proposal.

No additional information is needed.

XI. Evaluations Plans.

A. Criteria to be used to evaluate the quality and effectiveness of the program, including academic program student learning outcomes.

Student Learning Outcomes (SLOs) for the proposed Master of Science in Architecture will be modeled on existing SLOs used for graduate coursework in the current M.Arch. Track III program in the existing Master of Architecture:

SLO1: Mathematical Models—Students will demonstrate an understanding of the fundamental typology of the application of mathematical models to architectural problems.

The products evaluated for the MS-ARCH_SLO1 - Student Learning Outcome 1 are research into mathematical models and skills as represented in a portfolio of work produced in ARCH 5611 Computational Research Methods I, and participation in seminar leadership within the course. The assessed products include intelligent participation in discussion, and preparation of background information in graphic form for use in leading the seminar. This assessment uses a 4-point evaluation scale (4 – "Commendable"; 3 – "Satisfactory"; 2 – "Marginal"; 1 – "Unsatisfactory").

Collection: The instructor of record will submit scores by the day after final grades are due each spring term, with support from the Associate Director of the SoA and the CoA+A Assistant Dean for Advising & Assessment.

Analysis and Performance: Scores will be compiled, recorded and summarized by the CoA+A Assistant Dean for Advising & Assessment and sent to the SoA Associate Director for dissemination to the faculty. 75% of MS-ARCH students should score "Satisfactory" (3) on the SLO1 Mathematical Models assessment rubric, based on work reviewed in ARCH 5611 – Computational Research Methods I.

Dissemination to faculty: The Assistant Dean will forward a synopsis to the Director and the Associate Director of the School of Architecture (SoA) in a year-end report. A full synopsis of all assessments will be disseminated to the architecture faculty, first by email for information, and second in a full-faculty meeting in the spring semester for discussion.
Decision-making: All faculty involved in teaching in the 1st year MS-ARCH curriculum will meet with the Graduate Program Coordinator to discuss the data and its implications for curricular improvement to the courses / curriculum during coordination meetings preceding both the fall and spring semesters.

Evaluative criteria for this scale are defined below.

Student Learning 1: – Mathematical Models
Definition: An understanding of the fundamental typology of the application of mathematical models to architectural problems**.**
Product: Portfolio of work produced in ARCH 5611.

1: Unsatisfactory	**2: Marginal**	**3: Satisfactory**	**4: Commendable**
Fails to meet stated project requirements of the course relative to portfolio development and seminar participation (participation consistently lacking and/or non responsive).	Fails to meet stated project requirements of the course relative to portfolio development and seminar participation (participation lacking); OR has significant deficiencies in understanding and appropriate concepts; OR failure to demonstrate leadership of the seminar.	Meets stated project requirements of the course relative to portfolio development and seminar participation; exhibits significant *improvement* in understanding and discussion over the course of the semester; pursues new ideas and concepts.	Meets or exceeds stated seminar requirements of the course relative to portfolio development and seminar participation; exhibits significant *improvement* in understanding and discussion over the course of the semester; exhibits a desire to question and critique him or herself and is self-motivated to explore unfamiliar ideas and concepts.

SLO 2: Scripting—Students will demonstrate the ability to develop appropriate functional scripts using the Python scripting language to affect or create a design process.

The products evaluated for the MS-ARCH_SLO1 - Student Learning Outcome 2 are research into various fundamental design principles and skills and completion of 2-3 related scripting projects completed over the course of the semester. Students prepare a variety of representations and their work is individually evaluated through bi- weekly one-on-one desk critiques with their professor as well as through 3-4 public critiques over the course of the semester involving architecture faculty and professionals. The assessed products include 2-D representational media (digital media)—and 3-D representational media (digital modeling). This assessment uses a 4-point evaluation scale (4 – "Commendable"; 3 – "Satisfactory"; 2 – "Marginal"; 1 – "Unsatisfactory").

Collection: The instructor of record will submit scores to the SoA Associate Director and CoA+A Assistant Dean for Advising & Assessment by the day after final grades are due each spring.

Analysis and Performance: Scores will be compiled, recorded and summarized by the CoA+A Assistant Dean for Advising & Assessment and sent to the SoA Associate Director for dissemination. 75% of MS-ARCH students should score "Satisfactory" (3) on the SLO2 Mathematical Models assessment rubric, based on work reviewed in ARCH 5606 – Scripting

Dissemination to faculty: The Assistant Dean will forward a synopsis to the Director and the Associate Director of the SoA in a year-end report. A full synopsis of all assessments will be disseminated to the architecture faculty, first by email for information, and second in a full-faculty meeting in the spring semester for discussion.
Decision-making: All faculty involved in teaching in the 1st year MS-ARCH curriculum will meet with the Graduate Program Coordinator to discuss the data and its implications for curricular improvement to the courses / curriculum during coordination meetings preceding both the fall and spring semesters.

Evaluative criteria for this scale are defined below.

Student Learning Outcome 2: Python Scripting Skills **Definition:** Ability to develop appropriate functional scripts using the Python scripting language to affect or create a design process. **Product:** Portfolio of work produced in ARCH 5606.			
1: Unsatisfactory	**2: Marginal**	**3: Satisfactory**	**4: Commendable**
Fails to meet stated project requirements of the course relative to representational media (work consistently incomplete and/or late); OR fails to understand and/or execute the representational concepts and skills required for the course	Fails to meet stated project requirements of the course relative to representational media (work incomplete and/or late); OR exhibits limited *improvement* in understanding and/or execution over the course of the semester; OR has significant deficiencies in understanding and/or executing the computational design concepts and skills required for the course	Meets stated project requirements of the course relative to representational media; exhibits significant *improvement* in understanding and execution over the course of the semester; pursues new computational design ideas and/or technical skills	Meets or exceeds stated project requirements of the course relative to representational media; exhibits significant *improvement* in understanding and execution over the course of the semester; exhibits a desire to question and critique him or herself and is self-motivated to explore unfamiliar computational design ideas and/or technical skills

B. Measures (metrics) to be used to evaluate the program (include enrollments, number of graduates, and student success).

The proposed Master of Science in Architecture is expected to reach a steady-state of enrollment of approximately 12 students by the academic year 2020-21. This will be a full-time enrollment program with the expectation that students will complete the M.S. in Architecture within a 12-month format. Within this student population, we expect that 2-4 students will be dually enrolled in the M. Arch. Program. The program will be deemed successful if students receive competitive job offers from industry and/or public agencies, or proceed to enroll in other Master's or Ph.D. programs for additional studies.

The M.S. Arch. will be offered as a 100% on-campus program. The enrollment estimates are predicated on an analysis of the survey data referenced in above and an analysis of the enrollment trends of other non- and post-professional degree programs. For example, Georgia Tech currently offers a 30-credit hour post-professional M.S. in Architecture with concentrations in High Performance Buildings as well as Digital Design and Fabrication. These concentrations parallel areas of expertise that our faculty represent in Performance and Diagnostics and Design Computation respectively. Each year at Georgia Tech, approximately six students concentrate in High Performance Buildings and approximately four students concentrate in Digital Design and Fabrication. Virginia Tech also offers a 36-credit hour M.S. in Architecture with a concentration in Building Science, which is similar to the proposed Performance and Diagnostics concentration. Approximately two students per year enroll in Virginia Tech's M.S. in Architecture concentrating in Building Science. This enrollment data suggests that the SoA's projections for enrollment in the M.S. in Architecture degree are on par with or exceed those of our regional peers.

C. The plan and schedule to evaluate the proposed new degree program prior to the completion of its fourth year of operation.

The SoA will employ several of its on-going continuous improvement assessment processes to evaluate the proposed M.S. in Architecture program. Annual evaluation prior to the 4th year of operation will consist of a review of Student Learning Outcomes; achievements related to student recruitment, admissions and retention; student evaluations of course delivery; and, student research achievements such as co-authored conference or journal articles.

Data collected will also be used as a part of the SoA's Annual Reporting and annual evaluation of Student Learning Outcomes in COA+A.

- Annual Reporting: Unit Strategic Plans typically establish long-term goals, which are assessed annually for progress and relevance to the broader missions of the College and University. Since 2003, the university has used a comprehensive assessment process rooted in the University's Institutional Mission, extending that mission into each college and department/school through their Strategic Plans. This leads to an integrated institutional plan. SoA performance is measured by the alignment of its activities with the COA+A Strategic Plan and the alignment of the CoA+A Strategic Plan with the Institutional Mission. The Director of the SoA develops an Annual Report that is submitted to the Dean of the CoA+A, highlighting School, faculty, and student accomplishments, new action steps planned to achieve strategic goals, examples of data-driven decisions and improvements, and progress / performance outcomes made toward SoA Strategic Plan goals and objectives.

  The proposed M.S. in Architecture will be evaluated and assessed through processes in place for assessments of existing SoA degree programs. The SoA is required to perform regular assessments of its performance as a part of its compliance with accreditation criteria. Visiting accreditation review teams will be asked to review and comment upon the M.S. in Architecture program's performance.

- Program Self-Assessment: Assessments influence all facets of the operations of the SoA. They take different formats, arise in response to different mandates, inputs, information, and data from a range of sources. Regular assessments completed in the SoA include:

  - Data Development & Analysis: Student retention and time-to-degree (annual)
  - Data Development & Analysis: Admissions Data Analysis (academics, gender, etc.) (annual)
  - Data Analysis: Student academic progression through Advising procedures (every semester)
  - Student Learning / Success: Course performance indicated in grades (2 times every semester)
  - Student Learning / Work Quality: Panel review of student work in studios / courses (every semester)
  - Student Learning / Work Quality: End of year curriculum discussions (annual)

- Conditions for Accreditation: NAAB Annual Reporting (annual)
- Conditions for Accreditation: NAAB Accreditation Continuation Reviews (multi-year intervals)
- Student Learning: SACS SoA Learning Objectives for SACS (all terms, every program)
- Student Learning / Education Experience: On-line Course Evaluations (all courses, all terms)
- Student Learning / Education Experience: End of Year Student Surveys (annual)
- Student Learning / Education Experience: SLAP Advisory to the Director (monthly)
- Curricular Planning: Program and year level coordination (all terms)
- Curricular Planning: Curriculum Committee research, projects, initiatives (monthly)
- Departmental Activities and Progress: SoA reporting to the University (annual)

XII. Attachments. Attach the final approved Request to Plan as the first attachment following this document.

This proposal to establish a new degree program has been reviewed and approved by the appropriate campus committees and authorities.

Chancellor: _____ Date: 5/9/17

Chancellor (Joint Partner Campus): _____ Date: _____

Memorandum

Date: December 20, 2016

To: Courtney Thornton
AVP for Academic Programs

From: Ken Lambla
Dean, College of Arts + Architecture
UNC Charlotte

Re: Questions Regarding the Request to Plan for an M.S. in Architecture

Dear Colleagues,

This memo is written in response to your request for clarification regarding our Request to Plan for an M.S. in Architecture in the School of Architecture at UNC Charlotte. Our answers to your questions are listed below and the School of Architecture (SoA) has made editorial and content changes to the Request to Plan (see attached).

1. *We seek further clarification on the use of the term "post-professional" degree throughout the proposal and the target audience, as described. We would assume "post-professional" would indicate that qualified applicants must hold a certain degree, be licensed to practice as an architect, and potentially have a certain number of years in professional practice. However, there are several places in the proposal that indicate entering students may not be "professionals." They could obtain this degree at the same time as the M.Arch. (professional degree; see p. 5) or would not need to hold any particular degree or have any required years of practice to apply (see pp. 7-8).*

   We visited the websites of several M.S. programs listed on p.6 and did not find use of "post-professional." We did see use of terms like "non-professional" or, more frequently, they simply described requiring either an undergraduate degree in architecture or a "related design discipline."

   We have eliminated the use of the term "post-professional" and have replaced that term with "non-professional." Our proposed Master of Science in Architecture degree seeks applicants from diverse backgrounds; thus, applicants with an undergraduate degree in architecture, design and/or related disciplines are eligible. Although many of our prospective students will pursue this degree as a post-professional degree (particularly practicing architects), we agree that the use of the term "non-professional" reflects the language found in similar programs.

2. *What is the current level of sponsored research and scholarly output of the faculty who will participate in this degree program? While more detailed information would be required in a Request to Establish, we seek some early indication of the ability to address resource needs through external funding, for example.*

   SoA faculty have been very productive in their pursuit of external funding. Examples of externally funded grants secured by faculty include the following:

- $1,100,000 for the US Dept. of Energy Solar Decathlon, 2013 (Federal Funding: $100,000; Industry Funding: $500,000; State Funding: $300,000; Donations: $200,000).
- $125,000 in The State and Industry (Autodesk) funding for a new Robotics Lab, 2015.
- $350,000 in Federal ($150,000) and Industry ($250,000) funding for research focused on Sustainably Integrated Buildings and Sites, 2013-16.
- $151,500 in Autodesk Grant funding (Multivariate Design Strategies for Conceptual Design) 2016-17.

In addition to a range of externally funding research initiatives, faculty have also been active through scholarly publications. Examples of disseminated research include:

- Beorkrem, Chris, Material Strategies for Digital Fabrication, Routledge Press, Second Edition, 2017.
- Beorkrem, Chris, Book Chapter, *Critical Approaches to Contemporary Architecture,* Editors: Swati Chattopadhyay and Jeremy White, Routledge Publishing, 2016.
- Cho, I., Dou, W., Wang, D. X., Sauda, E., & Ribarsky, W. (2016). VAiRoma: A Visual Analytics System for Making Sense of Places, Times, and Events in Roman History. *Visualization and Computer Graphics, IEEE Transactions on*, *22*(1), 210-219.
- Sauda, Eric; Beorkrem, Chris; Christian, Scott; Danchenka, Evan; Hess, Trevor. "Prepared Music Field: Interactive Spatial Music Performances," 2015 Education and Research in Computer Aided Architectural Design in Europe (eCAADe).

This track record establishes a strong foundation for future external grants and projects to support students enrolled in the proposed M.S. program.

3. *Can you succinctly describe the overlaps and the distinctiveness regarding employment opportunities for M.Arch., M.S., and D.Des. graduates?*

The Master of Architecture (M.Arch.) is a professional (accredited) degree required to become a licensed architect and to practice architecture in North Carolina. M.Arch. programs vary in length from 2 to 3.5 years, depending on academic preparation at the undergraduate level.

The Master of Science (M.S.) degree is based on specialized research in the built environment intended to offer areas of expertise within the architectural and design industries not covered in professional architectural curricula. M.S. programs across the region and country typically provide areas of specialization that open new opportunities in computation, diagnostics, technology, or sustainability (to name a few). These areas may overlap with some aspects of architectural practice; however, the M.S. is a non-professional degree, which will not enable someone to practice architecture. Instead, the M.S. will provide specialized expertise that supports a range of practices within the design industries and building related IT services. Thus, the M.S. in Architecture will address changes in the practice of architecture and the increased premium placed on technology and specialized tasks that are are needed practice-based research teams, projects, and environments. M.S. programs may vary in length from 1 to 2 years.

The Doctor of Design (D.Des.) is an advanced design-based research degree aimed at design professionals who seek to augment their skills in order to transform and/or extend their practices (Carnegie Mellon) or to apply multidisciplinary research approaches to design-based investigations (Harvard). The D.Des. degree may also introduce opportunities to work in

academia or research-driven environments. The D.Des. is not required for architectural practice or for most specialized areas within the design industries. D.Des. programs are typically 3 years in length.

The Ph.D. in Design (NC State) is an academic and research-based degree aimed at advancing knowledge within a multi-disciplinary environment focused upon design disciplines. This requires original research in a specific area related to architectural or design disciplines. The Ph.D. is the more common path for individuals who plan to engage an academic career or a career in which research plays a primary role. This differs from the D.Des. in the sense that the Ph.D. is not typically an avenue for design professionals who are interested in advancing their practices; the Ph.D. is not required for architectural practice. Ph.D. programs are typically 5 to 7 years in length.

4. *P. 15 states that NC State "offers a 30-credit hour post-professional Master of Architecture…." while p. 16 states that "NC State does not currently offer post-professional degree at the Master's level in architecture." This seems contradictory. Also, their website seems to indicate a structure similar to the Tracks described at UNCC. https://design.ncsu.edu/academics/architecture/graduate-programs/master-architecture*

NC State uses the term post-professional in reference to a degree path within the Master of Architecture that is available only to applicants who hold a professional degree (B.Arch. or M.Arch.). NC State also offers a graduate certificate in an area that parallels our proposed program (Energy and Technology) but this is not a designated Master of Science program.

As noted above, our program is open to individuals with architecture and other related design degrees, thus a more accurate description for our program is that it will be a non-professional degree program focused upon Design Computation and Building Performance. As requested and noted above we have revised our Request to Plan document to reflect the focus and non-professional structure of our proposed M.S. in Architecture.

5. *We acknowledge that the Request to Plan does not require full budget details and so the presentation on p. 18 only gives a sense of the use of the differential tuition. It may be more appropriately titled, "Summary of Additional Costs for Proposed Program Covered by Differential Tuition." We would expect a Request to Establish budget to show the cost and source of funds for the program coordinator and program support, all graduate assistantships, etc.*

We have revised the title as suggested.

6. *Per the Educause report, the College of Architecture graduate programs are expected to double in enrollment between 2013 and 2019 (77 to 148) and with only one additional faculty member (p. 14 of report). Is it an accurate interpretation that the existing faculty capacity in the College significantly exceeds student demand? Or is another interpretation more appropriate?*

As stated in the Eduventures Report created for the Graduate School at UNC Charlotte (June 2014), the graduate enrollment in the College of Arts + Architecture was projected to grow between 44% (low) and 140% (Stretch) by years 2019 and 2020. A 92% growth rate was projected as the target for that same period. The percentages translate to enrollment numbers of 111 (low), 148 (target) and 185 (stretch) graduate students by 2020. At the time the report was completed (and at present), the School of Architecture was/is the only unit within the College of Arts + Architecture with a graduate student population. The College of

Arts + Architecture includes 5 units: the School of Architecture and the Departments of Art & Art History, Theater, Music, and Dance. The future development of graduate degree programs in other units within the College of Arts + Architecture will eventually contribute to the overall enrollment growth projections described in the Eduventures report.

The proposed M. S. in Architecture within the School of Architecture will also contribute to the overall enrollment goals of the College of Arts + Architecture. As of fall 2016, the School of Architecture had 105 graduate students in several degree paths (M.Arch I, M.Arch. II., M.U.D.); our current enrollment puts the overall growth projections in the College of Arts + Architecture within reach (low range of 111). The School of Architecture has already added faculty in recent years who can support the increase in student population due to the proposed M.S. in Architecture.

UNC CHARLOTTE
Office of the Chancellor
9201 University City Boulevard, Charlotte, NC 28223-0001
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October 26, 2016

Dr. Kimberly van Noort
Vice President for Academic Programs and Instructional Strategy
University of North Carolina
Post Office Box 2688
Chapel Hill, North Carolina 27515-2688

Dear Kim:

Enclosed is UNC Charlotte's Request to Plan a M.S. in Architecture. The proposed program focuses on emerging research critical to the architecture field, preparing students for careers in research and technology to develop tools for the design and evaluation of the built environment.

Thank you for your consideration of this request. Provost Joan Lorden or I would be pleased to respond to any questions that you may have.

Cordially,

Philip L. Dubois
Chancellor

cc: Joan F. Lorden, Provost and Vice Chancellor for Academic Affairs
Ken Lambla, Dean, College of Arts + Architecture
Courtney Thornton, Associate Vice President for Research and Graduate Education

UNIVERSITY OF NORTH CAROLINA

REQUEST TO PLAN

A NEW DEGREE PROGRAM – ANY DELIVERY METHOD

THE PURPOSE OF ACADEMIC PROGRAM PLANNING: Planning a new academic degree program provides an opportunity for an institution to make the case for need and demand and for its ability to offer a quality program. The notification and planning activity described below do not guarantee that authorization to establish will be granted.

Date: December 20, 2016

Constituent Institution: UNC Charlotte

Is the proposed program a joint degree program? Yes____ No **X**

Joint Partner campus _____

Title of Authorized Program: Architecture Degree Abbreviation: M.S.

CIP Code (6-digit): 04.0201 Level: B _____ M **X** D _____

CIP Code Title: _____

Does the program require one or more UNC Teacher Licensure Specialty Area Code? Yes_____ No **X**

If yes, list suggested UNC Specialty Area Code(s) here N/A

If master's, is it a terminal master's (i.e. not solely awarded en route to Ph.D.)? Yes **X** No____

Proposed term to enroll first students in degree program: *Term* Fall *Year* 2017

Provide a brief statement from the university SACSCOC liaison regarding whether the new program is or is not a substantive change.

> As required by the Policy Statement on Substantive Change for Accredited Institutions of the Commission on Colleges, the University of North Carolina at Charlotte (UNC Charlotte) is required to submit a letter of notification prior to implementation for new degree programs. Notification of this new degree program will be provided to SACS after approval by the University of North Carolina Board of Governors and prior to implementation. The link to Policy Statement on Substantive Change is included here: http://www.sacscoc.org/SubstantiveChange.asp

Identify the objective of this request (select one or more of the following)

- ☒ Launch new program on campus
- ☐ Launch new program online; Maximum percent offered online _____
  - ☐ Program will be listed in UNC Online
  - ☐ One or more online courses in the program will be listed in UNC Online
- ☐ Launch new site-based program (list new sites below; add lines as needed)

☐ Instructor present (off-campus delivery)
☐ Instructor remote (site-based distance education)

Site #1
N/A
(address, city, county, state) *(max. percent offered at site)*

Site #2
N/A
(address, city, county, state) *(max. percent offered at site)*

Site #3
N/A
(address, city, county, state) *(max. percent offered at site)*

Supply basic program information for UNC Academic Program Inventory (API) and UNC Online

Minimum credit hours required	**30**
Expected number of full-time terms to completion	**2**

1. Review Status.

a. List the campus bodies that reviewed and commented on this request to Plan proposal before submission to UNC General Administration. What were their determinations? Include any votes, if applicable.

- School of Architecture Curriculum Committee – January 28, 2015, Unanimous Support
- School of Architecture Faculty – February 4, 2015, Unanimous Support
- Graduate School Dean's Office – August 2, 2015, Approved
- College of Arts + Architecture Dean's Office – August 10, 2015, Approved
- Office of Academic Affairs

b. Summarize any issues, concerns or opposition raised throughout the campus process and comment periods. Describe revisions made to address areas of concern.

In their review, the School of Architecture Curriculum Committee and full Faculty were supportive of this proposal. After preliminary review by key faculty who will be intimately involved in the proposed Master of Science in Architecture and by the Dean of the College of Arts + Architecture, the sections about resources, especially space and faculty needs, were made more specific.

2. Description and Purpose

a. Provide a 250-word or less description of the proposed program, including target audience, delivery method, hours required, program core and concentrations (if applicable), post-graduate outcomes for which graduates will be prepared, and other special features. For programs with an online component, describe whether the delivery is synchronous with an on-campus course, partially synchronous, asynchronous, or other.

The Master of Science (M.S.) in Architecture focuses on emerging research critical to the architectural profession, which requires expertise that exceeds current criteria for accredited professional degrees. Thus, the M.S. in Architecture is distinct from the Master of Architecture (M.Arch.) currently offered at UNC Charlotte; the M.Arch. is a degree awarded only in association with programs that prepare students for professional licensure as required by the National Architectural Accrediting Board (NAAB).

The creation of an M.S. in Architecture will allow the School of Architecture to clearly distinguish this new non-professional research degree from its nationally-accredited professional degree. It will do so through an on-campus (full-time, 1 year, 30 credit hour) curriculum made up of core requirements (research methods and interdisciplinary skills) and concentration areas addressing emerging research needs within the architectural profession (Design Computation and Performance and Diagnostics).

According to *DesignIntelligence*'s Best Architecture Schools 2015 report, which polled 78 deans and chairs and over 1,000 architectural offices (respondents were allowed to provide multiple answers), the most significant concerns facing the profession include sustainability (49%), technological change (42%), and integrated design (47%). Similarly, the research priorities of the American Institute of Architects focus on building performance and diagnostics and new technological methods such as design computation.

In each case, these research areas represent educational needs that are not fully met by professionally accredited degree programs. While the School of Architecture's professional Master of Architecture (M.Arch.) degree prepares students for general practice, a research-based M.S. in Architecture degree will offer non-professional opportunities for deeper exploration of these critical issues facing the profession and society.

b. How does the proposed program align with system, institutional and unit missions and strategic plans?

This proposed Master of Science (M.S.) in Architecture aligns with the University of North Carolina system mission to "discover, create, transmit, and apply knowledge to address the needs of individuals and society" through "research, scholarship, and creative activities, which advance knowledge and enhance the educational process" (http://northcarolina.edu/About-Our-System/Our-Mission).

As a research-focused degree centered on the design of the built environment, the M.S. in Architecture contributes to UNC Charlotte's mission of being "North Carolina's urban research university." This mission is outlined in the UNC Charlotte Institutional Plan 2016-2021. In addition, with its objectives to produce and disseminate research, the proposed M.S. in Architecture will contribute to the following University goals (see: http://chancellor.uncc.edu/office-chancellor/mission-strategy-administrative-principles/institutional-plan):

- Goal 1: Deliver a high-quality, accessible, affordable, and integrated academic experience that produces responsible global citizens and a competitive workforce.
    - This proposal will help the University address this goal through a research focused integrated academic degree program.

- Goal 2: Stimulate increased research, creative activities, and community engagement with a focus on programs and partnerships that address the major needs of the Charlotte region.
    - This proposal will help the University address this goal through a research focused non-professional degree program that addresses marketplace needs within architectural and design related fields.

The proposed M.S. in Architecture directly addresses key goals of UNC Charlotte Division of Academic Affairs Academic Plan for 2016-2021 by exploring issues facing the architectural profession and by tightly connecting coursework and research. These goals and objectives include:

- Goal 2: To expand the frontiers of knowledge and leverage discovery for the public benefit through innovative programs that span the disciplines in research, creative activities, and graduate education
    - Goal 2 Objective 1: Continue the expansion of graduate education by
        - Offering accelerated and early entry master's programs in all colleges;
        - Identifying new opportunities for professional science master's programs;
        - Establishing a strategic number of new programs that meet state and national need and demand.

Having graduate students and faculty working together in research labs with both grant and institutional support will increase the scholarly output and reputation of the School of Architecture. Therefore, the M.S. in Architecture contributes to UNC Charlotte's objective to be an increasingly competitive urban research institution.

The proposed M.S. in Architecture also supports the Graduate School's 2015-2020 Strategic Plan's mission "to explore and advance the limits of knowledge and to define the state of the art in every field" while serving "society's needs in specific and technical and professional ways, but also to serve the need for intellectual expansion" (http://graduateschool.uncc.edu/sites/graduateschool.uncc.edu/files/media/DeansOffice/The-Graduate-School-2015-20-Strategic-Plan.pdf).

In addition, the establishment of the M.S. in Architecture will facilitate the School of Architecture's ability to better meet the Graduate School's projected graduate enrollment numbers as recommended by the June 2014 Graduate Enrollment Strategic Planning document (see Appendix C). This report calls for a doubling of the number of graduate students in the School of Architecture (to a target of approximately 150 students) by the 2019-2020 academic year.

This proposed M.S. in Architecture also aligns with College of Arts + Architecture goals of presenting "degree programs that align with emerging methods of practice in all arts and design disciplines" and that offer opportunities for "interdisciplinary arts and design thinking." These goals and objectives offer the School of Architecture an opportunity to conduct collaborative research in ways currently unavailable in the state of North Carolina; this is further articulated in the sections below.

c. What student-level educational objectives will be met by the proposed program?

The proposed Master of Science (M.S.) in Architecture addresses goals expressed in the recently adopted School of Architecture (SoA) 2015-2020 Strategic Plan (See Appendix D).

As stated in its Strategic Plan, the School of Architecture at UNC Charlotte will (Goal 1) Advance Excellence in the Built Environment through Research and Interdisciplinary Collaboration; and (Goal 2) Advance Excellence in the Built Environment through Innovative Design Practices.

Each goal addresses questions of educational and professional practice relevance through various objectives:

- Increasingly, design practices (professional firms) require specialized research skills that must be introduced in the academic environment.
    - The establishment of the M.S. in Architecture meets Objectives 1.1, 1.2, and 2.1 as well as action items 1.1.1, 1.2.1, and 2.1.5 in the SoA Strategic Plan.
    - The M.S. in Architecture will enable the SoA to provide specialized research and interdisciplinary educational opportunities to our students.
- Increasingly, design innovation requires specialized research areas currently not addressed within traditional accredited architectural degrees such as design computation as well as the development of "tools" for design, evaluation, and performance.

3. Student Demand. Provide documentation of student demand. Discuss the extent to which students will be drawn from a pool of students not previously served by the institution.

Due to increased research needs in both the profession and the academy, non-professional degrees in Architecture such as the Master of Science (M.S.) in Architecture have increased in number across the U.S. over the past decade. Currently, non-professional M.S. in Architecture degrees are offered in at least 21 states.

The M.S. in Architecture offers students an opportunity to conduct collaborative research in the proposed areas of concentration. No programs or universities in the state of North Carolina offer a non-professional Master of Science in Architecture degree.

We have an existing component to the Master of Architecture (M.Arch.) in the School of Architecture (track III) that we are proposing to convert to the non-licensure M.S. in Architecture. This track is in its fourth year with 9 currently enrolled students (as of spring 2016): two in their final year of the program; three students who will graduate in 2017; and four entering the program in fall 2016 (two of whom are pursuing a dual master's with a professional degree in architecture). With six or more students per year in each of the two concentrations plus 2 to 4 dual degree enrollments with the Master of Architecture, we expect to enroll 12 to 16 students per year in the Master of Science in Architecture by 2020.

The new accreditation criteria of the National Architectural Accreditation Board (NAAB), which accredits professional schools of architecture and their professional degrees, make it impossible to continue offering track III in our Master of Architecture (M.Arch.) degree. We are prohibited from including course content outside the new accreditation criteria in our accredited M. Arch. program. In its policies, the NAAB , states that the use the term "Master of Architecture" (M.Arch.) can only be used for the professional

degree in architecture. Thus, our current degree structure that includes a research track is in conflict with new accreditation standards set for architectural programs leading to registration:

- The National Architectural Accreditation Board has established a policy, which states that the practice of using the Master of Architecture nomenclature for unaccredited degrees is a violation of Condition II.2.2 of the *NAAB Conditions for Accreditation*.

The proposed M.S. in Architecture will enable us to comply with accreditation standards for Schools of Architecture and will expand the current Track III within the M.Arch. into a robust program of study. Therefore, the proposed M.S. in Architecture will be a distinct non-professional (non-licensure) research-focused degree. This degree distinction will address NAAB accreditation concerns and it will provide students in the School of Architecture at UNC Charlotte with unique opportunities to conduct advanced research with our faculty.

The M.S. in Architecture degree will allow UNC Charlotte to offer a graduate course of study that meets the growing marketplace demand for architectural research while broadening the pool of potential students eligible to apply to the School of Architecture. The M.S. in Architecture is most appropriate for students interested in pursuing advanced research at the Master of Science level. Currently, students interested in pursuing advanced research in architecture at the Master of Science level must leave the state to continue their education.

U.S. Schools Offering Master of Science (M.S.) in Architecture

State	*Institution*
Arizona	University of Arizona
California	New School of Architecture
	University of California Berkeley
Florida	University of Florida
Georgia	Georgia Institute of Technology
Illinois	Illinois Institute of Technology
Indiana	Ball State University
Maryland	University of Maryland
Massachusetts	Massachusetts Institute of Technology
Michigan	University of Michigan
Minnesota	University of Minnesota
Missouri	Washington University in St. Louis
Nebraska	University of Nebraska-Lincoln
New Jersey	New Jersey Institute of Technology
New York	Columbia University
	Pratt Institute
	Rensselaer University
	University of Buffalo
Pennsylvania	University of Pennsylvania
Ohio	Kent State University
	University of Cincinnati
Oregon	University of Oregon
South Carolina	Clemson University
Texas	Texas A&M University
	University of Texas-Austin
	University of Texas-San Antonio
Rhode Island	Roger Williams University
Washington	University of Washington

Virginia	Virginia Polytechnic Institute and State University

Schools within the Southeast Region Offering Master of Science (M.S.) in Architecture

State	*Institution*	*Concentrations*
Florida	University of Florida	Preservation Sustainability
Georgia	Georgia Institute of Technology	Digital Design High Performance Arch. Health
South Carolina	Clemson University	Health Animated Architecture Community Design History/Theory
Virginia	Virginia Polytechnic Institute and State University	Building Science Interior Design Urban Design

Of the schools in the region offering the M.S. in Architecture degree, none offer concentrations specifically focused in Design Computation or Performance and Diagnostics. Therefore, UNC Charlotte has the opportunity to become a leader within the Southeastern region in architectural research. The creation of an M.S. in Architecture will allow the School of Architecture at UNC Charlotte to clearly distinguish a new non-professional research degree from its nationally-accredited professional Master of Architecture degree and will enable the School of Architecture to expand and diversify its current degree portfolio.

UNC Charlotte School of Architecture Degree Portfolio

Bachelor of Arts in Architecture (B.A.)	pre-professional, non-accredited
Bachelor of Architecture (B.Arch.)	professional, accredited
Master of Architecture (M.Arch.)	professional, accredited
Master of Urban Design (M.U.D.)	non-professional, non-accredited
Master of Science in Architecture (proposed)	*non-professional, non-accredited*

As a non-accredited, research-based degree, the M.S. in Architecture does not require applicants to hold a professional degree in architecture in order to apply; students with backgrounds in related fields can also enroll in the program. In addition to broadening the pool of eligible students for the School of Architecture, the M.S. in Architecture can serve as a feeder to PhD programs in Computing and Informatics (CCI) and inter-disciplinary doctoral programs such as Infrastructure and Environmental Systems (INES) Program at UNC Charlotte. Exposure to coursework in CCI and ongoing collaborative research involving faculty from both Architecture and Computing and Informatics have been aspects of our current program that prospective students have found attractive. For example, 2 students from UNC Charlotte's existing Dual Master in Architecture and Information Technology have enrolled into the PhD program in Computing and

Informatics following their enrollment in the School of Architecture. The Dean of CCI points to the possibility of the proposed M.S. in Architecture providing potential recruits for his PhD programs in his letter of support (see Appendix B).

By establishing an entry point for students with novel backgrounds and diverse knowledge domains, the M.S. in Architecture will provide access to students interested in a career within the broader field of architecture and the built environment without having to overcome the barrier of prior training in an accredited degree program. By reducing barriers to graduate education in areas of specialization that support architectural practices, the M.S. in Architecture will help diversify both our student population and the future workforce at large.

4. Societal demand. Provide evidence of societal demand and employability of graduates from each of the following source types.
   a. Labor market information (projections, job posting analyses, and wages)
      i. specific to North Carolina (such as ncworks.gov, nctower.com, outside vendors such as Burning Glass)

Area, occupation, and industry profiles.
Charlotte is the largest architectural market in North Carolina and the Charlotte chapter of the American Institute of Architects (AIA) has over 800 members, the largest chapter in the State. Charlotte's 130 architectural design firms comprise the second largest concentration of architectural professionals in the South Atlantic region (after Atlanta) and include large branch offices for many of the country's largest design firms. This includes firms such as Gensler, Perkins + Will, HDR, and Perkins Eastman, all of which are listed in the top 12 of the 2015 Top 300 Architecture Firms in the U.S., ranked by revenue (as reported by Architectural Record in 2016). Several of these firms have provided Letters of Support for this proposal (see Appendix B).

Most of these offices have building performance, diagnostics, simulation, data analysis and computation-focused departments that use technology and research to develop new tools for the design and evaluation of the built environment.

For example, James R. Langlois (Principal and Vice President of HDR Architecture) states in his letter of support that a research based M.S. in Architecture "will be of great interest" as his firm plans for future recruitment efforts; David J. Segmiller (Managing Principal and Board Director of Perkins Eastman) states that the expertise gained by such a research based degree will "contribute significantly" to the success of his firm (see Appendix B).

The pool of possible professional partners within this context provides a unique opportunity for research in the discipline. UNC Charlotte's School of Architecture has already demonstrated its interest in leading research discussions within the discipline through hosting the national Architectural Research Centers Consortium (ARCC) Conference in 2013. The ARCC is an international association committed to expanding the culture of research in architecture and related disciplines. UNC Charlotte's participation as a leader in this national organization will be strengthened through the development of a research-based M.S. in Architecture degree.

Additionally, the June 2014 UNC Charlotte Graduate Enrollment Strategic Planning document (see Appendix C), prepared by the consulting research firm Eduventures, places architecture among the top ten growth areas in Masters level degree programs for the University. Eduventures points to the growing demand in

the architectural marketplace for architectural graduates, acknowledging that growth in the marketplace has outpaced the numbers of prospective employees entering into the field. As a result, there is growing demand from architectural firms for graduates from architectural programs. As the 16th largest city in the U.S. and one of the fastest growing urban centers, Charlotte is an ideal location for the growth of graduate programs focused on specializations within architecture and related disciplines. Graduates with an M.S. in Architecture degree from UNC Charlotte will have an immediate impact in the field by advancing research and through leadership in the profession.

NC occupational and employment projections.
According to the Occupational Analysis for Architects on NCWorks, "Employment of architects is projected to grow 17% from 2012 to 2022, faster than the average for all occupations. Competition for jobs will be strong as the number of applicants continues to outnumber available positions." According to the 2015 University of North Carolina Alumni Survey: University of North Carolina at Charlotte Report, 9% of UNC Charlotte alumni are in Architecture and Engineering fields. Offering students specializations within the field of architecture through the non-professional Master of Science (M.S.) in Architecture degree will contribute to their leadership, marketability and employability in this growing, competitive field.

While we anticipate some of the graduates from the proposed M.S. in Architecture will continue along a research track by seeking academic positions or entering PhD programs, others will seek to use their advanced research skills and advanced knowledge of issues facing contemporary practice in architectural firms.

Many of the largest firms in the country have in recent years added departments or divisions dedicated specifically to research, including Gensler, SOM, Perkins + Will, Perkins Eastman, and HDR. All of these national firms (except SOM) have offices in Charlotte. For example, Gensler, the largest architectural firm in the country by revenue, includes Building Performance, Sustainability, and Data Exploration among its research themes – all of which intersect with concentrations for the proposed M.S. in Architecture degree. In fact, their "Student and Graduate Career Guide" lists that their workforce represents many backgrounds and areas of expertise including information management specialists and states that their design process is based upon "deep and thoughtful research." Similarly, HDR, a national architecture, engineering and construction services firm, recently (August 2016) posted a "Digital Practice Office Leader" job announcement with primary required job skills in the areas of digital technologies, information management, computational design, and related delivery services.

These research themes do not overlap with current criteria required of broad-based accredited architectural programs, including the professionally-oriented and nationally-accredited Master of Architecture. The need for accredited architectural programs to address a comprehensive list of professional criteria in relatively short timeframes and limited credit hours results in an academic environment in which these critical issues are introduced but not explored in depth. The M.S. in Architecture will address both the needs of firms like Gensler seeking research skills and those of a firm like HDR who seek computational expertise as these architectural practices take on increasingly complex research agendas (see Appendix E).

Economic and demographic indicators.
According to the *Occupational Trends in a Transitioning Economy* report published by the NC Department of Commerce in November 2008, architectural,

engineering, and related services is one of the top five emerging industry clusters in North Carolina. According to the NC Department of Commerce's more recent *2010-2020 North Carolina Occupational Employment Projections*, an average of 2000 new job positions are opened each year in architectural and engineering fields in the state and 1,210 other jobs become available annually due to retirement or resignation of existing employees. In that same report, the rate of growth in these fields in North Carolina between 2010 and 2020 was projected at 25.5% for architects. Recent studies continue to point to positive growth trends.

As of August of 2016:

- employment projections remain steady with projected annualized growth of 1.0% and annual openings of 1,350 according to NC Department of Commerce website (http://nccareers.org/employmentprojections/occupation_employment_projections.html);

- the Bureau of Labor Statistics points to 2.7% grown in its 2024 projections (http://www.bls.gov/news.release/ecopro.t04.htm).

Graduates who hold an M.S. in Architecture degree in addition to a professional degree in architecture will have a competitive advantage in the marketplace as a result of their specialization and advanced skills.

ii. available from national occupational and industry projections (such as BLS).

National occupational and industry projections.
The *Occupational Outlook Handbook* of the US Bureau of Labor Statistics corroborates the growth projections of NCWorks cited above:

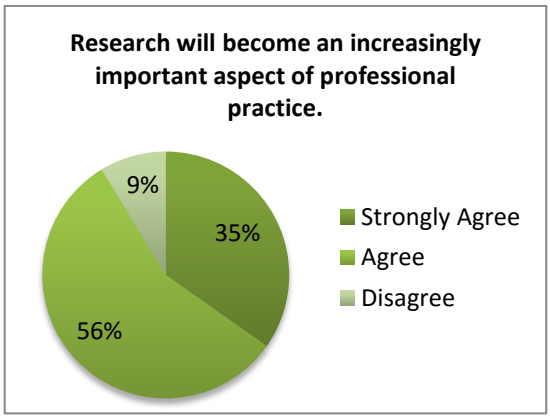
- Employment in architectural (and related) occupations is projected to increase by 3% and by approximately 67,200 new jobs between the years of 2014 and 2024 (http://www.bls.gov/ooh/architecture-and-engineering/home.htm).

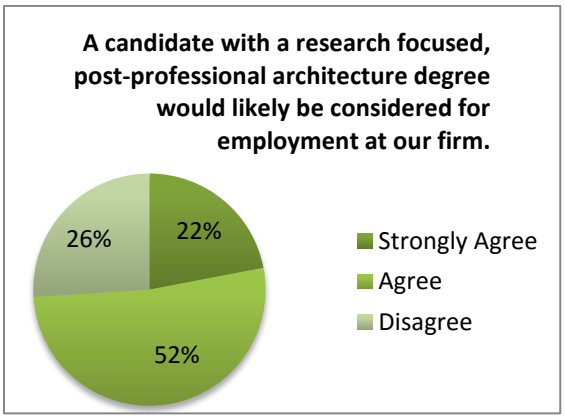
While this growth rate is somewhat slower than that of all occupations overall, the transitions from traditional drafting (for example) to more complex technologies such as design and computational software, point to the importance of degrees such as our proposed Master of Science (M.S.) in Architecture.

According to the American Institute of Architects *Compensation Report 2013*, the average entry-level salary for intern architects is $47,000 and the overall average compensation for architects is $76,700; these figures parallel those of the BLS, which lists entry level median pay for architects at $76,100. These surveys do not distinguish between entry-level positions filled by candidates with Bachelor or Master in Architecture degrees (the BLS simply lists entry level as a Bachelor's degree).

b. Projections from professional associations or industry reports

Projections from professional associations or industry reports.
From October of 2010 to January of 2011, 44 large regional and national architecture firms were polled for their reception of the proposed research-based master's degree; twenty-three responses were received. The responses were overwhelmingly positive:

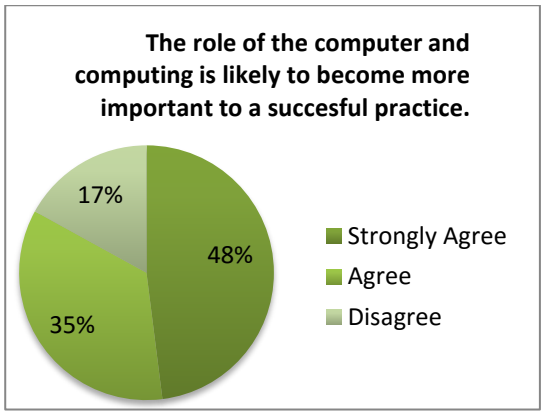


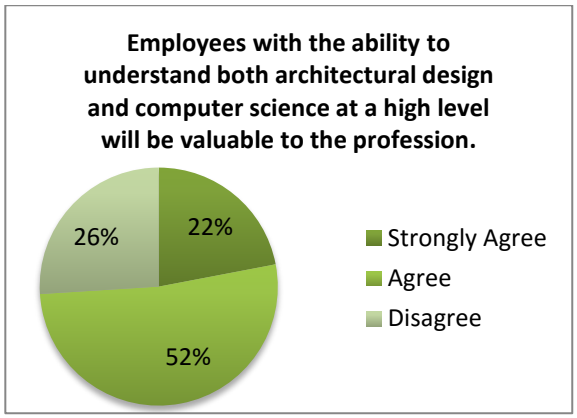


As the charts above indicate, respondents see research skills as valuable assets that future employees will need. In the words of one respondent:

"To me this program will better prepare students for the ever changing, dynamic field of design and architecture. It will create an opportunity for students to develop and research new and appropriate design methodologies that in my opinion are greatly needed. Furthermore, this program will enable students to address the growing demand from clients that we measure the impact of remarkable design beyond esthetics. I appreciate that UNCC is thinking about the future and preparing students to make that measurable impact."

Regarding Design Computation specifically, the survey responses were also positive:





When surveyed (2010-11) specifically about the merits of a Master of Science (M.S.) in Architecture with concentrations in Design Computation and/or Performance Diagnostics, architectural and engineering professionals suggested "architecture has needed this model of research degree for some time" and it "is clearly a worthwhile and meaningful pursuit that will benefit the profession as a whole". One survey respondent noted that his or her firm had hired two recent UNC Charlotte architecture students specifically because of their diagnostics experience and its applicability to high performance building design.

We continue to see interest in research expertise and skills from design professionals. Chris Jarrett, the Director of UNC Charlotte's School of Architecture, recently spoke with a group of professionals at the 2016 AIA South Atlantic Region Conference in Savannah, GA (Sept. 29 to Oct. 1, 2017) all of whom work in medium-sized to large architecture firms. There was complete consensus that advanced architectural research in the context of a focused, non-professional study (through an M.S. in

Architecture) would be advantageous to the profession and to prospective employees entering a competitive marketplace. These architects all mentioned that the profession is diversifying and expanding, with increasing specialization and expertise expected of architects in their firms by clients - from sustainability to technology and computation to program specialization to project delivery. The need for graduates from schools of architecture with a specialized course of study that addresses research skills not covered by the professional accredited B.Arch. or M.Arch. is growing.

According to the AIA Billing Index, as of November 2014, the majority of architecture firms in the country are continuing to experience an increase in projects for which they are generating revenue. Firms in the Southern part of the United States in particular are experiencing much stronger growth than in other parts of the country. According to a recent report, "billings have increased at firms located in the South for the last twenty-nine consecutive months," suggesting a strong market of potential employers in the region for graduates of the M.S. in Architecture.

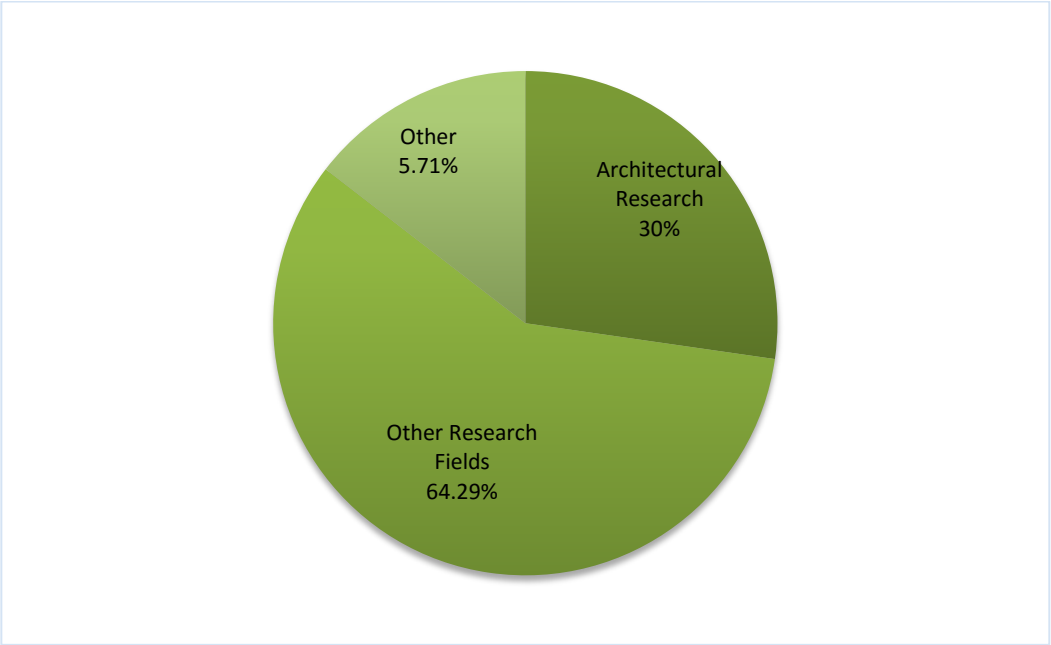
c. Other (alumni surveys, insights from existing programs, etc.).

In December 2014 online survey of UNC Charlotte School of Architecture alumni was conducted to gauge interest in post professional degree programs. The survey received 128 responses, approximately 59% of alumni respondents are currently working in the state of North Carolina. That survey captured responses from alumni who received a Bachelor of Arts degree (57.81%), Bachelor of Architecture (44.53%), Master of Architecture (18.76%), and Master of Urban Design (1.56%); the majority of respondents received their degree prior to 2012 (87.50%).

This survey is valuable in highlighting where our current alumni are working (in state or elsewhere) and highlighting the interest that working professionals may have in non-professional degree offerings.

UNC Charlotte has been graduating Bachelors of Architecture students since 1976. A recent search of the School's alumni base contains 2,066 Architecture alumni of which 1,269 remain in North Carolina; of these, 647 are in Mecklenburg County while 825 are in surrounding counties. Many of these alumni will be reaching career transitions and may be interested in enrolling in the proposed non-professional program.

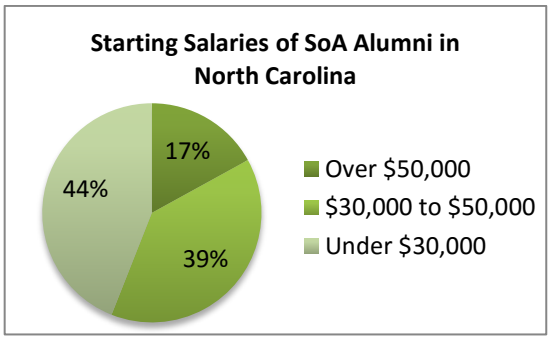
Alumni Interested in Non-Professional Degree Paths

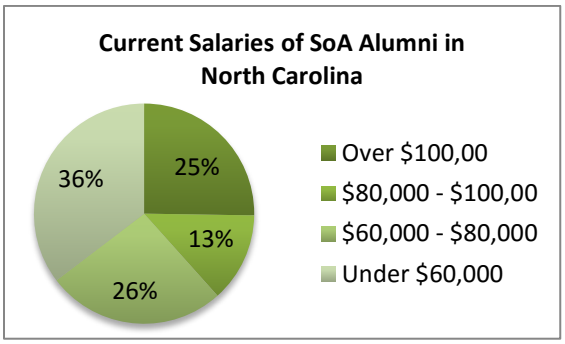


For example, that 2014 survey indicated that nearly 30% of respondents would consider specializing within the field in the future by completing a research-focused, non-professional Master of Science (M.S.) in Architecture. Additionally, of the respondents who indicated that they were pursuing graduate studies at the time of the survey, 64.29% stated that they were pursing degrees in other fields. This points to the interest of our alumni in academic experiences that go beyond the curriculum of the accredited degree program.

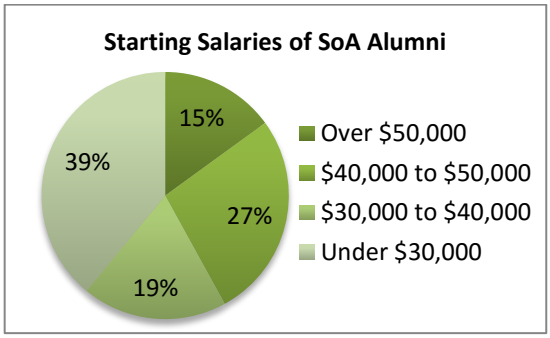
According to DesignIntelligence's *Best Architecture Schools 2015* report, 19.5% of students with a professional accredited Bachelor or Master in Architecture degree will pursue an advanced non-professional degree, such as the proposed M.S. in Architecture. Accredited degrees in architecture are a requirement for professional licensure, as is an internship period following graduation. An added advantage for architectural interns to return to school for a non-professional M.S. in Architecture is offered by the National Council of Architecture Registration Boards (NCARB). NCARB, which sets national licensing standards for architects, allows the hours needed for advanced degree course work to be used to shorten the time before taking the Architect Registration Exam (ARE). Therefore, academic study leading to an M.S. in Architecture can contribute towards both licensing and internship requirements and greater marketability for prospective employees.

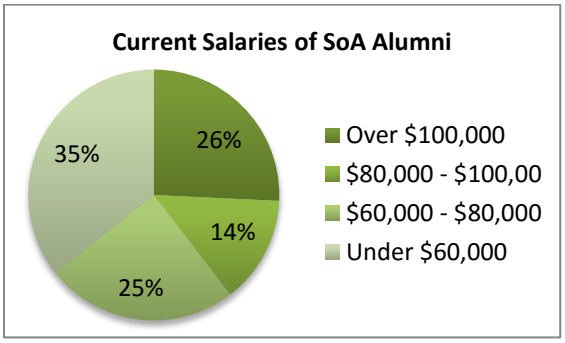
The 2014 alumni survey also provided useful information on salaries and employment. This data aligned with other national data supporting the conclusion that additional research expertise will likely make our future alumni more competitive in an increasingly complex marketplace. The proposed M.S. in Architecture will, thus, provide competitive advantages for our future alumni both in terms of their abilities to gain employment but also in terms of their starting salaries and potential for advancement.





The charts above illustrate findings drawn from a 2014 survey of UNC Charlotte School of Architecture alumni. The survey indicated that salary statistics in North Carolina corresponded to salaries of architects employed in the U.S. and beyond (4d). It should be noted that 58.73% of respondents were employed in North Carolina while 41.27% have found employment in another state. Over 95% of total respondents are employed in architecture or a related field and nearly 80% found a job within architecture within six months of graduation.





The charts above illustrate starting salaries for alumni of the School of Architecture as compared with current salary ranges. When we first began to consider this new program proposal in November 2014, the website of the Charlotte Chapter of the American Institute of Architects (AIA Charlotte) included twenty Charlotte-area jobs in architecture posted within the preceding six weeks. In September 2016, there are seventeen Charlotte-area jobs in architecture posted within the preceding four weeks.

Similarly, the AIA's Career Center listed over 90 local area job openings in June of 2016. According to the AIA Career Center, which includes offerings across the country, over 320 jobs were posted within the month of June 2016. On the job board of the website Archinet, one of the most visited architectural sites in the world, approximately 150 jobs are posted each month; several of these seek architecturally trained employees with a range of research and computational skills (see Appendix E).

According to the Association for Computer Aided Design in Architecture (ACADIA), in 2014-15 there were ten open faculty searches in North America for Schools of Architecture seeking candidates specifically with research expertise in digital computation. As recently as August of 2016, ACADIA listed an opening for a Digital Director at a UNC institution, which would fit well with the skills of a graduate of our proposed M.S. in Architecture (see Appendix E). These sources indicate that there is a market for candidates who hold a non-professional M.S. in Architecture and with expertise in computation.

Lastly, while we anticipate that some of the graduates from the proposed M.S. in Architecture will continue along a research track by seeking academic positions or entering PhD programs, the majority will seek to use their advanced research skills and advanced knowledge by engaging in practices within architectural firms.

5. Unnecessary duplication.

a. List all other public and private four-year institutions of higher education in North Carolina currently operating programs similar to the proposed new degree program, including their mode of delivery. Show a four-year history of enrollments and degrees awarded in similar programs offered at other UNC institutions (using the format below for each institution with a similar program); describe what was learned in consultation with each program regarding their experience with student demand and job placement. Indicate how their experiences influenced your enrollment projections.

Institution:
____N/A_____

Program Title:
____N/A_____

	(year)	(year)	(year)	(year)
Enrollment	N/A	N/A	N/A	N/A
Degrees-awarded	N/A	N/A	N/A	N/A

No other university in North Carolina offers an M.S. in Architecture degree program.

North Carolina State University (NC State) is the only other institution in North Carolina that offers graduate degrees in Architecture. Its degree offerings include an accredited, professional Master of Architecture (M.Arch.) that parallels UNC Charlotte's professional degree program (M.Arch.).

NC State offers a 15 credit hour certificate in Energy and Technology in Architecture to its students enrolled in its graduate architecture program and also offers certificates in City Design, Housing, and a soon to be launched certificate in Architecture in the Public Interest.

NC State also offers a 30-credit-hour post-professional Master of Architecture with concentrations in the same areas as their certificates; according to NC State's website, these programs are intended as preparation for individuals to "assume responsible roles in the profession of architecture." However, their program requires an undergraduate Bachelor of Architecture (professional) degree for admission. It is for this reason that the program can be called a Master of Architecture since it is a 2-year component of a 5 year undergraduate architectural degree. Therefore, the program at NC State cannot accept students with non-architecture backgrounds.

Our proposed Master of Science (M.S.) in Architecture will be open to students with undergraduate degrees in other fields. Our proposed M.S. in Architecture and its planned areas of concentration (Design Computation and Performance and Diagnostics) differ from those offered at NC State, therefore, they do not duplicate areas of study in the state.

NC State also offers a Doctorate in Design and graduate certificates. While research-focused, NC State's Doctorate of Design differs in duration and scope from the proposed M.S. in Architecture.

b. Identify opportunities for collaboration with institutions offering related degrees and discuss what steps have been or will be taken to actively pursue those opportunities where appropriate and advantageous.

We do not anticipate student based collaborations between our proposed Master of Science (M.S.) in Architecture and NC State's certificate or Doctoral programs. In a recent telephone conversation (August 2, 2014) with the Director of NC State's PhD and Certificate programs, Dr. Soolyeon Cho, it was confirmed that NC State does not currently offer non-professional degree at the Master's level in architecture. And, given the short timeframe of our proposed program (2 semesters), it is unlikely that student collaboration will be feasible. However, faculty and research collaborations are possible if common research goals are identified.

We intend to focus our collaboration within UNC Charlotte primarily with the Departments of Computer Science and Software and Information Systems within the College of Computing and Informatics, and with the Department of Electrical and Computer Engineering in the College of Engineering (see Appendix B). Our collaborations support a (currently operating) research-based, two-year dual masters as a component of the School of Architecture's Master of Architecture degree program. Currently, the Master of Architecture – track III / Computer Science Information Technology degree, has been operating since the Fall of 2013. This program served as a critical testing ground for the proposed M.S. in Architecture degree. However, due to accreditation standards and restrictions concerning M.Arch. programs, the School of Architecture must transition this non-professional degree to the proposed M.S. degree platform.

Faculty in the School of Architecture (SoA) already have close ties with research units across the campus. In the field of Design Computation, these include research relationships with the Future Computing Lab (Computer Science), Human Computer Interaction Lab (Software and Information Systems), and the Charlotte Visualization Center (College of Computing and Informatics). For Performance and Diagnostics, the primary partner research unit has been the Center for Sustainably Integrated Buildings and Sites – SIBS (Lee College of Engineering). The SoA aims to build on these relationships and the mutual interests with researchers across campus to create unique programs (the current combination of information technology/computer science and architecture faculty teaching together is unique in the country).

c. Present documentation that the establishment of this program would not create unnecessary program duplication. In cases where other UNC institutions provide similar online, site-based distance education, or off-campus programs, directly address how the proposed program meets unmet need.

There are no equivalent programs in North Carolina. See Item 5 above for additional detail. A telephone conversation (August 2, 2014) with the Director of NC State's PhD and Certificate programs in the College of Design, Dr. Soolyeon Cho, confirmed that NC State does not currently offer non-professional degree that can accept students with non-architecture backgrounds.

6. Enrollment. Estimate the total number of students that would be enrolled in the program during the first year of operation and in each delivery mode (campus, online, site – add lines as needed):

The Master of Science (M.S.) in Architecture will be offered as a 100% on-campus program.

Delivery Mode_Campus__ Full-Time ___8 - 10_____ *Part-Time* ____0_____

Estimate the total number of students that would be enrolled in the program during the fourth year of operation and in each delivery mode (campus, online, site – add lines as needed):

Delivery Mode_Campus__ Full-Time ___16_____ *Part-Time* ___0_____

The Master of Science (M.S.) in Architecture will be offered as a 100% on-campus program. The enrollment estimates are predicated on an analysis of the survey data referenced above and an analysis of the enrollment trends of other non-professional degree programs. For example, Georgia Tech currently offers a 30-credit hour M.S. in Architecture with concentrations in High Performance Buildings as well as Digital Design and Fabrication. These concentrations correspond with the proposed concentrations in Performance and Diagnostics and Design Computation respectively. Each year at Georgia Tech, approximately six students concentrate in High Performance Buildings and approximately four students concentrate in Digital Design and Fabrication. Virginia Tech also offers a 36-credit hour M.S. in Architecture with a concentration in Building Science, which is similar to the proposed Performance and Diagnostics concentration. Approximately two students per year enroll in Virginia Tech's M.S. in Architecture concentrating in Building Science. These enrollment data suggests that the School of Architecture's projections for enrollment in the M.S. in Architecture degree are on par with or exceed those of our regional peers.

7. Resources. Will any of the resources listed below be required to deliver this program? (If yes, please briefly explain in the space below each item, state the estimated new dollars required at steady state after four years, and state the source of the new funding and resources required.)

a. New Faculty: Yes_____ No __X___

The Computational Design and Performance and Diagnostics faculty of the School of Architecture are well positioned to teach the necessary sections of courses and work with the new Master of Science (M.S.) in Architecture students on the specialized research initiatives. These existing resources can support an M.S. program with an average fulltime enrollment of 16 students. However, these specialized (tenured and tenure track) faculty members also currently contribute to teaching core architectural studios. To grow the M.S. program beyond 16 students per cohort, additional tenure track faculty would be required. We do not foresee growth over 16 students per cohort within the first 5 years of the program.

Summary of Additional Costs for Proposed Program *Covered by Differential Tuition*

Institution	**UNC Charlotte**
Degree(s) to be Granted	**M.S. in Architecture**
Tuition Differential	**$875.00**

PROJECTED ENROLLMENT

	Year 1	Year 2	Year 3	Year 4
Projected Full Time Student (1.0 FTE)	10	12	14	16
Projected annual FTE Students	10	12	14	16
Projected annual differential tuition	**$8,750**	**$10,500**	**$12,250**	**$14,000**

PROPOSED BUDGET OF DIFFERENTIAL TUITION

	Year 1	Year 2	Year 3	Year 4
	$8,750	$8,750	$10,000	$10,000
Graduate Assistantships/ Scholarships				
Recruitment	-	$1,750	$1,500	$1,500
Program Workshops/ Seminars	-	-	$750	$750
Technology	-	-	-	$1,750
TOTAL	**$8,750**	**$10,500**	**$12,250**	**$14,000**

ADDITIONAL COSTS

b. Faculty Program Coordination: Yes ___X__ No _____

c. Additional Library Resources: Yes _____ No __X___

d. Additional Facilities and Equipment: Yes _____ No __X___

e. Additional Other Program Support: Yes __X___ No _____
(for example, additional administrative staff, new Master's program graduate

student assistantships, etc.)

Current facilities in the School of Architecture's fabrication and research labs are up to date and appropriate for teaching and research needs of the M.S. in Architecture program.

As a research-based program, the M.S. is closely linked to research labs, thus graduate student assistantships will be necessary to support some new students. This will be especially important in the early years in order to attract high caliber students and build the new program.

An objective of this new research-based degree is to build the teams required to seek extramural grants to support research; however, in the M.S. program's foundational years, during which faculty will build the necessary research funding base required to support graduate enrollment, additional supplemental graduate student support from the University, College, and School will likely be required.

8. Curriculum leverage. Will the proposed program require development of any new courses? If yes, briefly explain.

Under the current Master of Architecture (M.Arch.) program, courses have already been introduced that will serve the Master of Science (M.S.) in Architecture students**.** Initially, the majority of the courses that are required for the M.S. in Architecture degree will be drawn from existing courses in the School of Architecture as well as from the departments of Computer Science, Information Technology, Electrical and Computer Engineering, and Geography and Earth Sciences. New courses may be needed if enrollment exceeds our projections.

The proposed M.S. in Architecture will also enable the School of Architecture to address newly adopted accreditation policies that limit the use of the M.Arch. degree to accredited professional architectural degrees. Current computation and performance-based courses in the School of Architecture will form the basis for the proposed M.S. degree. Thus, the proposed M.S. in Architecture will be distinct from the professional Master of Architecture (M.Arch.) in its dedicated research focus and will address accreditation compliance criteria.

9. Funding Sources. Does the program require enrollment growth funding in order to be implemented and sustained? If so, can the campus implement and sustain the program should enrollment growth funding be unavailable? Letters of commitment should be provided.

We are prepared to implement this new degree program through the reallocation of existing resources. The School of Architecture charges graduate students a tuition increment that can be used to support our existing and proposed graduate programs, including limited research assistantships. This increment funding would not be sufficient to cover new faculty or additional RA positions. Additional needed funding for graduate student support will be provided by faculty pursuit of external funding, the College of Arts and Architecture, and the Graduate School.

9a. For graduate programs only:

Does the program require a tuition differential or program specific fee in order to be implemented and sustained?

The Master of Science (M.S.) in Architecture will require the same tuition increment as other graduate programs in the School of Architecture.

i. If yes, state the amount of tuition differential or fee being considered, and give a brief justification.

The currently approved tuition increment for full time students in graduate programs in the School of Architecture is $875 per semester. This increment currently helps cover the costs of the purchase and maintenance of the specialized equipment, hardware, and software in the School of Architecture research labs, printing and computer labs, and metal, wood, and digital fabrication labs This increment also helps support graduate student research staff in the Digital Arts Center (D-Arts) and Integrated Design Research Lab (IDRL).

ii. Can the campus implement and sustain the program if the tuition differential or program fee is not approved? Letters of commitment from the Chancellor and/or Chief Academic Officer should be provided.

Yes, please see attached letter of commitment from the Provost in Appendix A.

10. For doctoral programs only:

a. Describe the research and scholarly infrastructure in place (including faculty) to support the proposed program. N/A

b. Describe the method of financing the proposed new program (including extramural research funding and other sources) and indicate the extent to which additional state funding may be required. N/A

c. State the number, amount, and source of proposed graduate student stipends and related tuition benefits that will be required to initiate the program. N/A

11. Contact. List the names, titles, e-mail addresses and telephone numbers of the person(s) responsible for planning the proposed program.

Peter Wong
Associate Professor | Graduate Program Director
School of Architecture | College of Arts + Architecture
plwong@uncc.edu
704-687-0134

José L.S. Gámez
Associate Professor | Associate Director
School of Architecture | College of Arts + Architecture
jlgamez@uncc.edu
704-687-0104

Chris Jarrett
Professor | Director
School of Architecture | College of Arts + Architecture
chjarrett@uncc.edu
704-687-0103

This request for authorization to plan a new program has been reviewed and approved by the appropriate campus committees and authorities.

Chancellor: Phil. J Nubow Date: 10/26/16

Chancellor (Joint Partner Campus): _____ Date: _____

Appendices:

A. Letter of Commitment from the Provost

B. Letters of Support

C. 2014 UNC Charlotte Graduate Enrollment Strategic Planning Document

D. SoA 2015-2020 Strategic Plan

E. Sample Job Postings

Appendix A: Letter of Commitment from the Provost

UNC CHARLOTTE

Office of Academic Affairs

9201 University City Blvd, Charlotte, NC 28223-0001
t/ 704.687.5717 f/ 704.687.1457 www.uncc.edu

October 27, 2016

Dr. Kimberly van Noort
Vice President for Academic Programs and Instructional Strategy
University of North Carolina
Post Office Box 2688
Chapel Hill, North Carolina 27515-2688

Dear Kim,

Enclosed is UNC Charlotte's Request to Plan a M.S. in Architecture. The proposal provides a summary budget which includes tuition differential. UNC Charlotte is committed to funding the expenses for the degree as described by reallocating funds, if needed.

Thank you for your consideration of this request.

Sincerely,

Joan F. Lorden
Provost and Vice Chancellor for Academic Affairs

cc: Courtney Thornton, Associate Vice President for Research and Graduate Education

Appendix B: Letters of Support

UNC CHARLOTTE
College of Computing and Informatics
Office of the Dean

9201 University City Boulevard, Charlotte, NC 28223-0001
t/ 704.687.8450 f/ 704.687.6979 www.cci.uncc.edu

August 4, 2016

Chris Jarrett
Director and Professor
School of Architecture
9201 University City Boulevard Charlotte, NC 28223

Dear Director Jarrett,

The College of Computing and Informatics at the UNC Charlotte is in support of the plan by the School of Architecture to develop a research-based, post-professional Master of Science (MS) in Architecture degree. Such a degree builds upon the on-going collaborations between our faculty and faculty in Architecture, in the context of both research and teaching.

The proposed MS in Architecture focuses on emerging fields of research critical to the architectural profession that represent areas of expertise that go beyond current criteria of the School's nationally-accredited professional degree. As a post-professional research-oriented degree in architecture with a concentration in computation, the proposed MS in Architecture is distinct from our current degree programs in the College of Computing and Informatics, and as such, it does not duplicate nor does it pose a challenge to our curricular offerings in our College. Unlike other Schools of Architecture in the region and beyond, an MS in Architecture does not currently exist in the state of North Carolina.

The MS in Architecture will allow the School of Architecture at UNC Charlotte to offer a graduate course of study that will meet the growing demands of architectural research and research leadership in the profession while broadening the pool of potential students who may be interested in pursuing research intensive degree programs such as our own PhD.

The College of Computing and Informatics strongly supports the School of Architecture in its mission to develop a Master of Science in Architecture degree.

Sincerely,

Yi Deng, Ph.D.
Dean and Professor
College of Computing and Informatics

214 North Tryon Street
Suite 2320
Charlotte NC 28202
USA

Tel 704.377.2725
Fax 704.377.2807

Gensler

May 17, 2015

Chris Jarrett
Director and Professor
School of Architecture
9201 University City Boulevard
Charlotte, NC 28223

Dear Director Jarrett,

Gensler is in support of the plan by the School of Architecture at UNC Charlotte to develop a research-based, post-professional Master of Science (MS) in Architecture degree. Our firm is known for being a research-oriented organization. Each year we solicit internal research proposals and then fund the most promising work. Last year we published the work of nearly 150 research projects as a way to give back to the community.

In many of our offices, there is ongoing work on materials, environmental strategies, and the changing needs of office workers. The Charlotte office is one of two offices within Gensler's Southeast region with dedicated staff focused on consulting. That practice allows us to assist clients with organizational change, portfolio optimization, and workplace strategies as they navigate new ways to align their physical space with the needs of their workforce. Our clients are asking for help with keeping their businesses relevant in a time of rapid change.

The challenges of the built environment in the 21st century are increasingly complex, from urbanization and energy conservation to sustainability and public health. Many of the challenges facing the profession today increasingly demand advanced, collaborative and interdisciplinary-based research to address a wide range of architectural issues from building performance and integrated design processes to new technological methods and systems of project delivery.

The School of Architecture at UNC Charlotte is well positioned to contribute to the field by advancing new knowledge in architecture. Nearly a third of the faculty have doctoral degrees with expertise in energy modeling, urban visualization, and design computation. The school's Integrated Design Research Lab (IDRL), including the Daylighting and Energy Performance Lab, have developed strong partnerships with researchers across campus to create unique programs, including entry in the 2013 Solar Decathlon and collaborative research with faculty in the Center for Sustainably Integrated Buildings and Sites (SIBS) in the Lee College of Engineering.

Research relationships with the Future Computing Lab (Computer Science), Human Computer Interaction Lab (Software and Information Systems) and the Charlotte Visualization Center (College of Computing and Informatics) have forged new collaborative partnerships over the last five years. These successes position the School well to develop initial MS concentrations in Building Performance and Design Computation.

Gensler strongly supports the School in its mission to develop a research-based Master of Science (MS) in Architecture degree. Graduates of this program will be well equipped to support the increasing demand of research by the architectural profession and society at large.

Sincerely,

John W. Gaulden, AIA, LEED AP
Managing Director

May 18, 2015

Chris Jarrett, Director and Professor
University of North Carolina Charlotte, School of Architecture
9201 University City Boulevard
Charlotte, NC 28223

RE: HDR's Support of a Research-based MS Degree Program
University of North Carolina Charlotte, School of Architecture

Dear Director Jarrett:

HDR supports the plan by the School of Architecture at UNC Charlotte to develop a research-based, post-professional Master of Science (MS) in Architecture degree.

We are a worldwide professional services company with nearly 10,000 employees in more than 225 locations around the world, including four in North Carolina. Our company is primarily comprised of architects, engineers, and scientists working for demanding clients on highly complex and sophisticated design projects. Our healthcare and research design programs are ranked as the most comprehensive of any design firm in the world. Each program has a foundation in research-based design, and as one of the country's top 10 employers of architects, the UNCC CoA research-based degree will be of great interest to us as we think about recruiting future talent.

HDR is among the first Advocate Firms for the EDAC (Evidence-Based Design Accreditation and Certification) program developed by The Center for Health Design (CHD), a nonprofit research, education and advocacy organization. We have over 100 certified EDAC Professionals on staff and we understand the importance of research-based, proven design. Our team of experts conducts EBD workshops to analyze the effects of facility design that contribute to decreased length of stay, reduced infection rates, patient falls and medication errors, improved patient and staff satisfaction, and overall improvement in efficient delivery of patient care and clinical outcomes.

We know that schools must be ahead of the curve by offering new and updated degrees to meet and exceed the challenges within the industry, Designing the built environment in the 21st is increasingly complex, from addressing urbanization and energy conservation to integrating sustainability and understanding the issues affecting public health. Many of the challenges facing the profession today demand advanced, collaborative and interdisciplinary-based research to address a wide range of architectural issues from building performance and integrated design processes to new technology and innovative ways to deliver projects.

We think the School of Architecture at UNC Charlotte is well positioned to continue its contribution to the field by advancing new knowledge in architecture. Nearly a third of the faculty has doctoral degrees with expertise in

energy modeling, urban visualization and design computation. The school's Integrated Design Research Lab (IDRL), including the Daylighting and Energy Performance Lab, has developed strong partnerships with researchers across campus to create unique programs, including entry in the 2013 Solar Decathlon and collaborative research with faculty in the Center for Sustainably Integrated Buildings and Sites (SIBS) in the Lee College of Engineering. With another effort to elevate research to a new level, the Future Computing Lab (Computer Science), Human Computer Interaction Lab (Software and Information Systems) and the Charlotte Visualization Center (College of Computing and Informatics) have forged new collaborative partnerships on many projects over the last five years. These successes ideally position the School to develop initial MS concentrations in Building Performance and Design Computation.

HDR strongly supports the School in its mission to develop a research-based Master of Science (MS) in Architecture degree. We are confident that graduates of this program will be well equipped to support the increasing demand for research by the architectural profession and the communities in which they work.

Sincerely,

HDR Architecture, Inc.

James R. Langlois, AIA, LEED AP
Principal & Vice President

Perkins Eastman

ARCHITECTURE
CONSULTING
INTERIOR DESIGN
PLANNING
PROGRAMMING

May 18, 2015

Chris Jarrett
Director and Professor
School of Architecture
9201 University City Boulevard
Charlotte, NC 28223

Dear Director Jarrett,

Perkins Eastman, Inc. is in support of the plan by the School of Architecture at UNC Charlotte to develop a research-based, post-professional Master of Science (MS) in Architecture degree.

The Charlotte office of Perkins Eastman values its relationship tremendously with UNC Charlotte and especially the School of Architecture. We employ quite a few graduates of your program and enjoy the opportunities to participate in critiques and advisory to Architecture and Urban Planning. As an international firm with offices worldwide we appreciate the dedication and quality of your graduates and student interns and their contributions to our success as a firm

The challenges of the built environment in the 21st century are increasingly complex, from urbanization and energy conservation to sustainability and public health. Many of the challenges facing the profession today increasingly demand advanced, collaborative and interdisciplinary-based research to address a wide range of architectural issues from building performance and integrated design processes to new technological methods and systems of project delivery. Perkins Eastman is a knowledge based firm with 12 distinct practice areas in a variety of building types and we believe heavily in the value of research as evidenced by our commitment to research in most all of the different building types that we design.

We believe that the School of Architecture at UNC Charlotte is well positioned to contribute to the field by advancing new knowledge in architecture. Nearly a third of the faculty have doctoral degrees with expertise in energy modeling, urban visualization, and design computation. The school's Integrated Design Research Lab (IDRL), including the Daylighting and Energy Performance Lab, have developed strong partnerships with researchers across campus to create unique programs, including entry in the 2013 Solar Decathlon and collaborative research with faculty in the Center for Sustainably Integrated Buildings and Sites (SIBS) in the Lee College of Engineering. Research relationships with the Future Computing Lab (Computer Science), Human Computer Interaction Lab (Software and Information Systems) and the Charlotte Visualization Center (College of Computing and Informatics) have forged new collaborative partnerships over the last five years. These successes position the School well to develop initial MS concentrations in Building Performance and Design Computation.

NORTH AMERICA
BOSTON, MA
CHARLOTTE, NC
CHICAGO, IL
LOS ANGELES, CA
NEW YORK, NY
PITTSBURGH, PA
SAN FRANCISCO, CA
STAMFORD, CT
TORONTO, ON
WASHINGTON, DC
SOUTH AMERICA
GUAYAQUIL, ECU
ASIA
MUMBAI, IND
SHANGHAI, PRC
MIDDLE EAST
DUBAI, UAE

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Perkins Eastman

ARCHITECTURE
CONSULTING
INTERIOR DESIGN
PLANNING
PROGRAMMING

Perkins Eastman strongly supports the School in its mission to develop a research-based Master of Science (MS) in Architecture degree. Graduates of this program will be well equipped to support the increasing demand of research by the architectural profession and society at large. We believe that their expertise can contribute significantly to our success as a firm.

Sincerely,

Perkins Eastman

David J. Segmiller AIA
Managing Principal and Board Director

PERKINS+WILL

May 17, 2015

Chris Jarrett
Director and Professor
School of Architecture
9201 University City Boulevard
Charlotte, NC 28223

Dear Director Jarrett,

Perkins+Will, Inc. is in support of the plan by the School of Architecture at UNC Charlotte to develop a research-based, post-professional Master of Science (MS) in Architecture degree.

As background, our firm, Perkins+Will, is a global interdisciplinary design firm with 1800 staff in 24 offices. In our 80th year of practice, we continue to see the growing need for a research-based approach to design. To meet this need we are aggressively growing our own research initiative, including a dedicated research team, published journals, and a non-profit arm of our practice (AREA Research). Collaboration with universities is a critical part of our approach. No matter how robust our own research efforts may become, we believe that collaboration between academics and practitioners will be required to maintain a rigorous and impactful approach. Therefore, programs such as the MS in Architecture at UNC Charlotte are extremely necessary.

The challenges of the built environment in the 21st century are increasingly complex, from urbanization and energy conservation to sustainability and public health. Many of the challenges facing the profession today increasingly demand advanced, collaborative and interdisciplinary-based research to address a wide range of architectural issues from building performance and integrated design processes to new technological methods and systems of project delivery.

The School of Architecture at UNC Charlotte is well positioned to contribute to the field by advancing new knowledge in architecture. Nearly a third of the faculty have doctoral degrees with expertise in energy modeling, urban visualization, and design computation. The school's Integrated Design Research Lab (IDRL), including the Daylighting and Energy Performance Lab, have developed strong partnerships with researchers across campus to create unique programs, including entry in the 2013 Solar Decathlon and collaborative research with faculty in the Center for Sustainably Integrated Buildings and Sites (SIBS) in the Lee College of Engineering. Research relationships with the Future Computing Lab (Computer Science), Human Computer Interaction Lab (Software and Information Systems) and the Charlotte Visualization Center (College of Computing and Informatics) have forged new collaborative partnerships over the last five years. These successes position the School well to develop initial MS concentrations in Building Performance and Design Computation.

PERKINS+WILL

Perkins+Will strongly supports the School in its mission to develop a research-based Master of Science (MS) in Architecture degree. Graduates of this program will be well equipped to support the increasing demand of research by the architectural profession and society at large.

Sincerely,

Phil Harrison, FAIA LEED AP
President and CEO
Perkins+Will Inc.

Copy: John Haymaker, PhD AIA LEED AP, Director of Research, Perkins+Will

C. 2014 UNC Charlotte Graduate Enrollment Strategic Planning Document

UNC CHARLOTTE
The Graduate School

Graduate Enrollment Strategic Planning

University of North Carolina, Charlotte

June 2014

EDUVENTURES

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EXECUTIVE SUMMARY

UNC Charlotte launched a long-term graduate enrollment planning initiative to establish graduate enrollment goals that are consistent with the vision and mission of the university. To support the process of developing its first plan, UNC Charlotte partnered with Eduventures, a research and advisory firm specializing in higher education, who worked with college associate deans, department chairs, and program directors to inform this report.

This plan, at the target, estimates 31% graduate enrollment growth by 2020 and 49% growth by 2025 (Table 1). In order to achieve these goals by 2025, the colleges requested resources in the form of faculty and staff lines, student funding, and physical space, such as classrooms, offices, and other research and educational areas. The body of this report outlines each college's enrollment goals and requested resources.

Table 1. Summary of Enrollment Goals for 2019-20 and 2024-25

	2019-2020			2024-2025		
	Low	Target	Stretch	Low	Target	Stretch
Enrollment Goals	**5,311**	**6,303**	**7,127**	**6,014**	**7,217**	**8,209**
Enrollment Growth[1]	10%	31%	48%	25%	49%	70%

These goals have been approved by each college dean and reviewed by the Graduate School for consideration by the Chancellor and Provost of UNC Charlotte. Program-level goals and detailed resource requests can be found in the Appendix of this report.

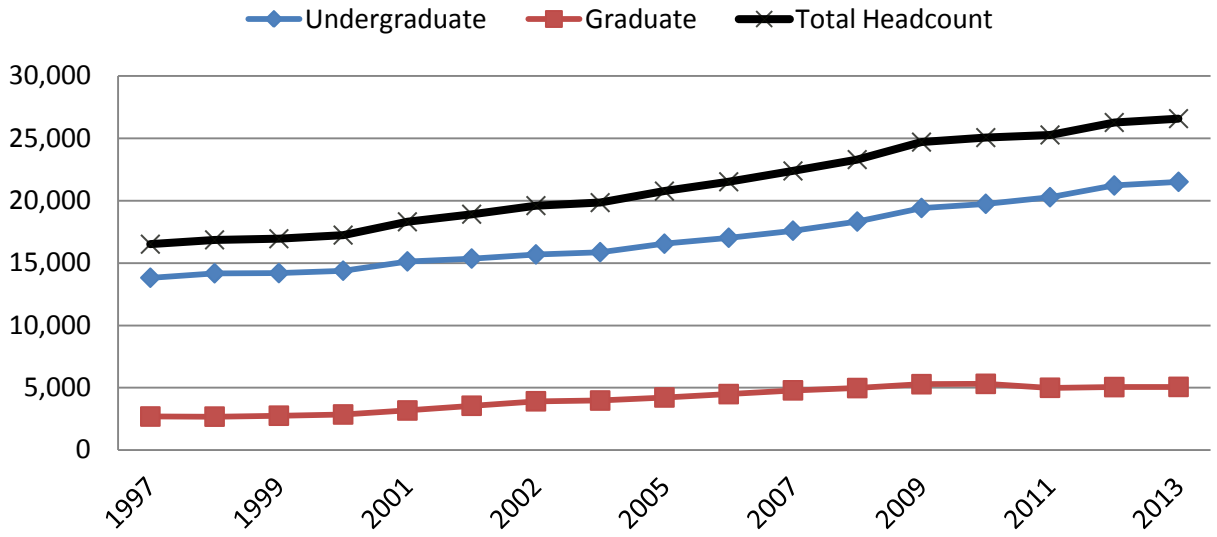
The final section outlines the Graduate School's conclusions and recommendations for investments in areas identified as having the greatest need to build capacity for graduate enrollment growth. To meet enrollment targets, the University must commit to graduate education as a strategic priority, integrating it into the overall planning, evaluation, and resource allocation processes.

[1] Percent change between fall 2013 and goal.

BACKGROUND AND CHARGE

UNC Charlotte's history has been marked by steady enrollment growth. Since 1997, the University has grown from 16,611 students to 26,584 in the fall of 2013 (Figure 1). Graduate enrollment has nearly doubled in that time, from 2,689 to a high of 5,308 in 2010. In 2011, graduate enrollment dropped to below 5,000 students, but in the last couple of years, has slowly begun to increase again, with 5,068 graduate students enrolled in the fall of 2013. It's anticipated, however, that based on graduate enrollment for spring 2014, the fall 2014 numbers will again drop below 5,000.

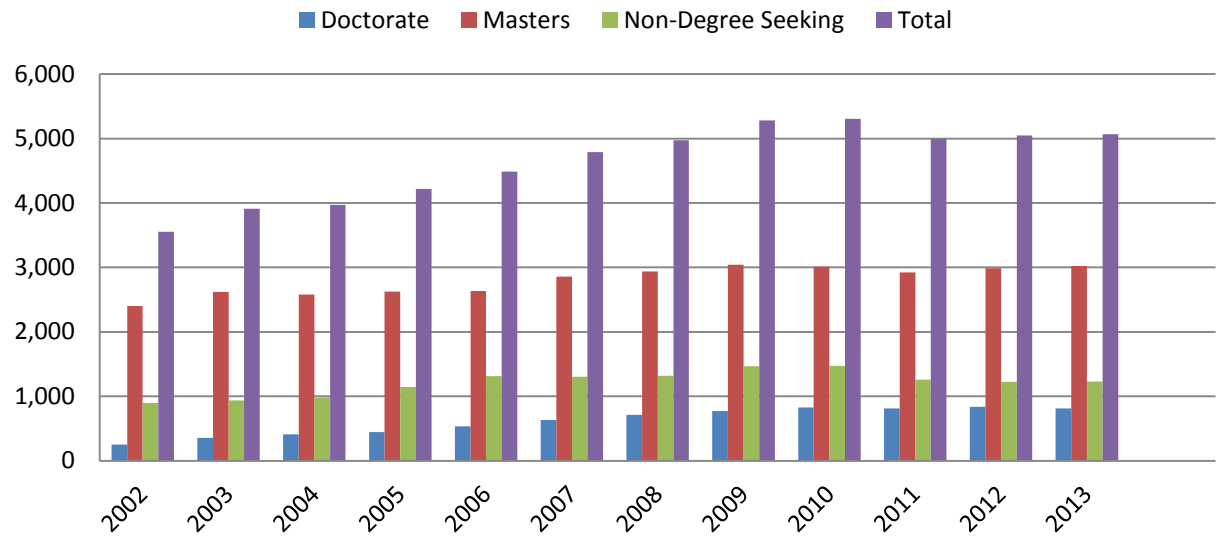
Figure 1. Student enrollment at UNC Charlotte, fall term headcount



Doctoral education began at UNC Charlotte in 1994 with the implementation of three PhD degrees and an incoming class of 8 students. By 2002, 252 students were enrolled in nine doctoral programs (Figure 2). Rapid expansion of new degrees continued, and in eight years, the University had an inventory of 19 programs and over 800 doctoral students. The enrollment decline in 2011 and spring 2014 was primarily at the master's and certificate levels in the College of Education, a trend that may turn if legislative changes in summer 2014 support graduate education for teachers moving forward.

Although growth has been good, there are environmental trends that create a growing need to look to the future and plan how to grow graduate programs. Enrollment increase funding is now tied to student success and support; retention, efficiency, and graduation impact funding of the University by the State. The pace for the approval of new degree programs has slowed dramatically, and there is much greater scrutiny by the North Carolina Legislature and UNC Board of Governors around program viability and cost. Federal and state legislative changes (e.g., decreasing support for research, federal student-loan policy, teacher education) have had a negative effect on graduate education, and changing student demographics (e.g., fewer high school graduates, a volatile international student market) may impact our ability to recruit, enroll, and retain graduate students.

Figure 2. Changes in graduate enrollment from 2002 to 2013.



In March 2013, Chancellor Dubois initiated a phased long-range enrollment planning initiative. In the first phase, a forecast was developed for undergraduate enrollment through 2020.[1] This project was completed in May 2013, and Chancellor Dubois subsequently charged the Dean of the Graduate School to lead a long-range enrollment initiative to establish enrollment goals consistent with the vision and mission of UNC Charlotte. The graduate long-range enrollment plan would use the enrollment target developed by the undergraduate planning initiative, which projects 35,000 students by 2020. The plan would consider changes in the composition of the student body, most notably, expanding the proportion of graduate and professional students, particularly at the doctoral level, so that 25% of students are enrolled at the graduate level.

In conducting the graduate enrollment plan, Chancellor Dubois instructed that targets should focus on:

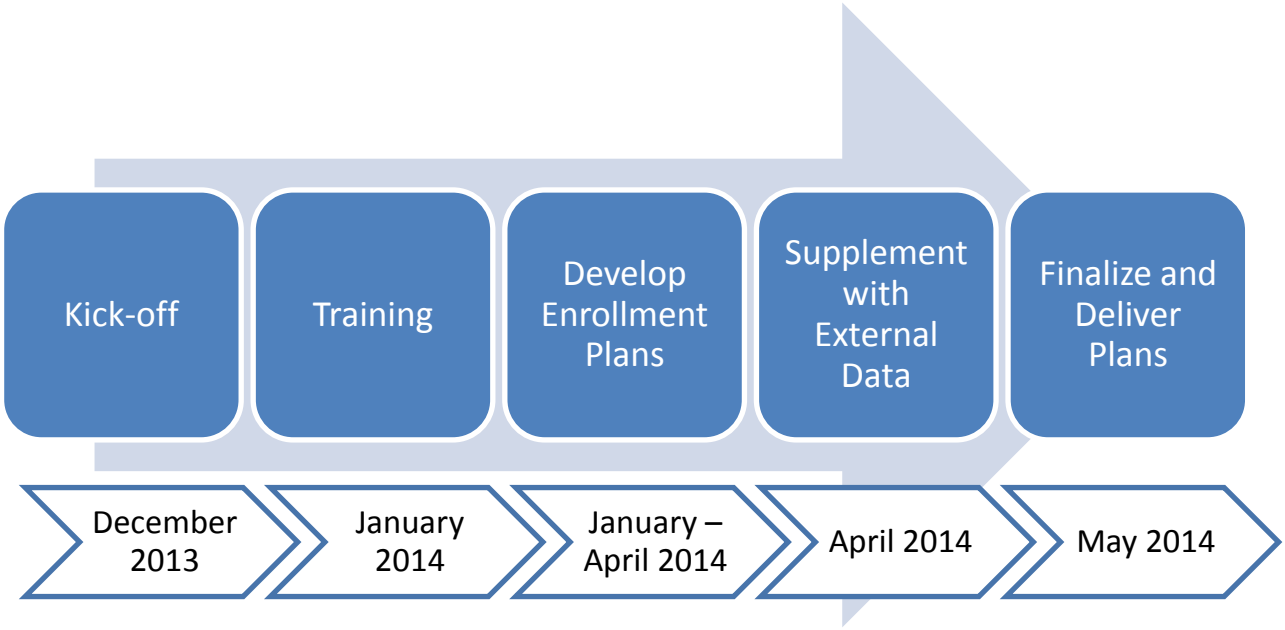
- The capacity for existing graduate programs to grow.
- Consideration of the development and implementation of new degree programs, particularly at the doctoral level, bearing in mind that the pace of new program approval has slowed.
- The resources required to support this enrollment plan.

[1]Long-Range Enrollment Planning Stage One Enrollment Projections for UNC Charlotte 2014-2020

METHODOLOGY

In order to develop this long-term graduate enrollment plan, UNC Charlotte launched a university-wide initiative in fall 2013 with the goal of completing the first plan by April 2014. Based on feedback from the colleges and challenges to data collection, this deadline was extended to May 2014 by the Graduate School. To support the process of developing its first plan, UNC Charlotte partnered with Eduventures, a research and advisory firm specializing in higher education. The timeline for the engagement was as follows:

Figure 3. Graduate Enrollment Planning Process Timeline[2]



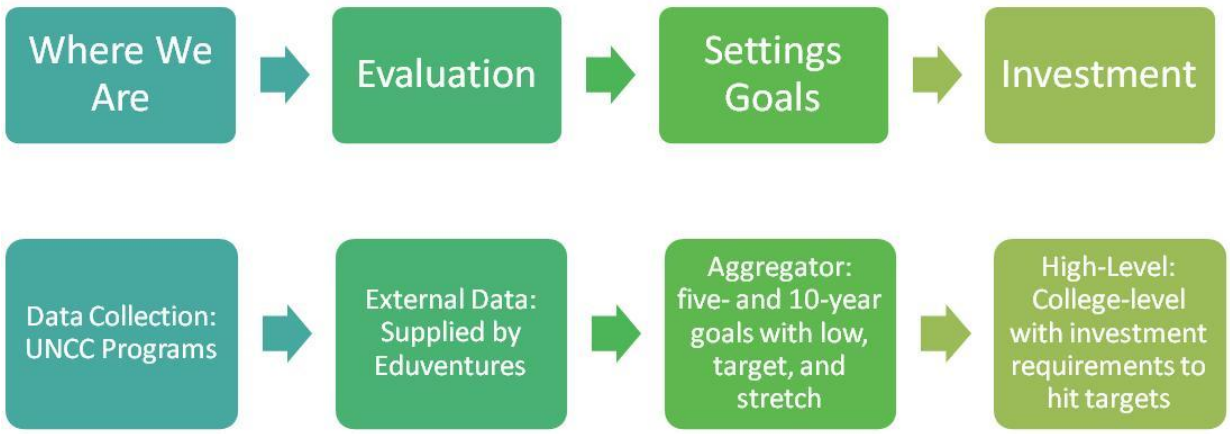
Eduventures recommended that UNC Charlotte use a deductive approach to develop its graduate enrollment plan (see Figure 4 on next page). In order to gather the necessary program-level data for enrollment goal setting, Eduventures developed a process for UNC Charlotte that included gathering data from the UNC Charlotte Institutional Research Office (IR) and the Graduate Program Directors (GPDs) for each graduate degree and certificate program offered. UNC Charlotte has not engaged in systematic program-level enrollment planning in the past, and as such, did not have the infrastructure in place to support data gathering across 137 programs. For this initial planning stage, Eduventures provided a web-based survey platform (Qualtrics) to gather the required data from the GPDs. Eduventures pre-populated the program-level data supplied by IR into that platform, allowing the GPDs the ability to view their data online. Once data collection was completed, Eduventures supplied the college liaisons with the graduate program data provided by UNC Charlotte as well as market data provided by Eduventures.

[2] Refer to page 8 for detailed timeline.

The Graduate School provided a list of 137 program codes to Eduventures, which were programmed into Qualtrics to allow for each degree program to have a unique log-in. Eduventures then provided on-site training at UNC Charlotte to train the GPDs on the data collection process. Based on feedback from the GPDs, some edits were made to the web form, which went live on Monday, February 3, 2014. It should be noted that five GPDs expressed doubt that the program level data supplied by Institutional Research were accurate. The Graduate School worked directly with the GPDs and Institutional Research to address any inaccuracies.

The first step of the plan was to gather data to understand where each of UNC Charlotte's graduate programs is today. Next, Eduventures supplied external data[3] on the supply and demand for UNC Charlotte's current suite of programs to identify areas of opportunities for the University. Next, the internal and external data were used by the departments to guide their goal-setting process and determine which programs had the greatest potential for growth. This helped determine what level of investments was to be requested by each college. Following the completion of this study, if a program is recommended to be enhanced or invested in, an action plan should be developed by the Graduate School in conjunction with the program's Associate Dean and Graduate Program Director.

Figure 4. Process for Developing Graduate Enrollment Plan



Where We Are

In order to make data-driven decisions, data are needed for each of UNC Charlotte's graduate programs. To collect these data in a consistent manner, a Program Planning Form was completed for each program with a graduate program director. The Program Planning Form collected a variety of information on topics such as program design, capacity, enrollment funnel, progress to degree, and funding. Certain data, such as enrollment funnel and progress to degree, were collected centrally through Institutional Research and were pre-populated for each program.

[3] Refer to definitions on next page for more information on the data supplied.

Evaluation

Once the internal data were collected and arranged in a systematic manner, Eduventures supplied key external (market) data. Eduventures used federal data and proprietary databases to examine degree conferrals and labor market statistics, such as projected employment growth. Eduventures then used these data to triangulate the supply and demand for programs. External data were coupled with UNC Charlotte's internal data to help prioritize the programs.

Setting Goals

Program data from each college were compiled into aggregator forms by the college liaisons and graduate program directors. GPDs and college liaisons were trained to use the data to inform the development of key performance indicators and metrics to determine goals for each of the programs. For each program, six goals were set: five-year and 10-year, with target, safety, and high goals.

Investment

All of the programmatic data were rolled up into the high-level plan, which focuses on overall college data. For programs that need to be enhanced or invested in, the estimated costs to reach the target and high goals were calculated.

Once discrepancies in the data were identified and corrected, Eduventures arranged for biweekly check-ins with the college liaisons to provide support during the data-gathering and evaluation process. College liaisons were provided program and college enrollment goal-setting templates, and they completed the data-gathering process in conjunction with the graduate program directors and department chairs.

Table 2. Timelines

Milestone	Date	Outcome
Kick-off of Graduate Enrollment Strategic Planning Project	Nov 2013	
On-Site Enrollment Planning Kick-off with Deans	Dec 16, 2013	Outline of strategic enrollment planning process and UNC Charlotte project
GPD on-site training	Jan 29-30, 2014	Campus weather closure resulted in training on 1/30/2014 only
Web platform launch	Feb 3, 2014	
First round of edits to program codes provided by UNC Charlotte	Feb 4, 2014	IR data no longer viewable on web form
IR data reports sent to GPDs	Feb 7-10, 2014	
Deadline for GPDs to complete program data	Feb 14, 2014	Campus weather closure resulted in deadline extension to 2/19/2014
GPD Program Data Revised deadline	Feb 19, 2014	45% Completed
College liaison biweekly check-ins begin	Feb 26, 2014	Update on data completion status; schedule next check-in
GPD Meeting (Eduventures attends via video conference)	Feb 28, 2014	Training on goal-setting process; outline of upcoming milestones
Second round of program code edits provided by UNC Charlotte	Mar 4, 2014	Develop new strategy for collecting department-level data from GPDs
Eduventures shares UNC Charlotte graduate enrollment planning template with colleges	Mar 11, 2014	
Deadline for college liaisons, department chairs and program directors to set preliminary enrollment goals and develop initial set of required investments	End of March	Develop initial draft of individual college enrollment plans using template provided
Department Chairs and Program Directors finalize individual program goals and requested budget needed	April 18, 2014	Return completed graduate enrollment planning templates to college liaisons
College liaisons review and consolidate the individual program templates into single college enrollment plan, including any additional college-level resource requests	April 30, 2014	Submit College Enrollment Plans to the Graduate School and Eduventures
Eduventures delivers final report to the Graduate School	June 6, 2014	

GRADUATE ENROLLMENT PLANS

Enrollment Projections (5 and 10 years)

The colleges estimate enrolling a target of 6,303 graduate students by 2020 and 7,217 students by 2025, which represents 31% and 49% growth, respectively (Tables 3 and 4).

Table 3. Enrollment Goals for 2019-20 and 2024-25, by College

College	Fall 2013	2019-2020 Goals			2024-2025 Goals		
		Low	Target	Stretch	Low	Target	Stretch
Art + Architecture	77	111	148	185	148	185	222
Business	668	700	1,000	1,250	750	1,250	1,500
Computing and Informatics	450	703	805	881	970	1,074	1,175
Education[4]	1,723	1,385	1,453	1,521	1,453	1,521	1,591
Engineering	500	627	855	1,056	668	912	1,175
Health and Human Services	494	471	613	755	471	613	755
Liberal Arts and Sciences	858	1,100	1,150	1,200	1,275	1,350	1,425
The Graduate School	58	214	279	279	279	312	366
Total Graduate Enrollment	**4,828**[5]	**5,311**	**6,303**	**7,127**	**6,014**	**7,217**	**8,209**

[4] The College of Education has cited a number of challenges that are projected to have a negative impact on their ability to attract graduate students. Please refer to the Conclusions and Recommendations and College of Education college-specific plan on page 41 of the Appendix for more information on these challenges.

[5] There are about 250 undesignated enrolled graduate students who are not included in these projections.

Table 4. Percent Growth Between Fall 2013 and Goal, by College

College	Fall 2013	2019-2020 Goals			2024-2025 Goals		
		Low	Target	Stretch	Low	Target	Stretch
Art + Architecture	77	44%	92%	140%	92%	140%	188%
Business	668	5%	50%	87%	12%	87%	125%
Computing and Informatics	450	56%	79%	96%	116%	139%	161%
Education	1,723	-20%	-16%	-12%	-16%	-12%	-8%
Engineering	500	25%	71%	111%	34%	82%	135%
Health and Human Services	494	-5%	24%	53%	-5%	24%	53%
Liberal Arts and Sciences	858	28%	34%	40%	49%	57%	66%
The Graduate School	58	269%	381%	381%	381%	438%	531%
Total Graduate Enrollment		**10%**	**31%**	**48%**	**25%**	**49%**	**70%**

Supplemental Student Funding Support

In order to achieve these enrollment goals, the following student funding support will be needed in addition to the current amount of student funding.

Table 5. Supplement Student Funding Support Requested to Meet Enrollment Goals, by College

College	2019-2020 Goals			2024-2025 Goals		
	Low	Target	Stretch	Low	Target	Stretch
Art + Architecture[6]	$314K	$314K	$314K	$418K	$418K	$418K
Business[7]	$0	$0	$0	$0	$0	$0
Computing and Informatics[8]	$2.1M	$2.1M	$2.1M	$4.6M	$4.6M	$4.6M
Education[9]	$252K	$378K	$504K	$378K	$504K	$630K
Engineering[10]	$370K	$625K	$935K	$502K	$895K	$1.2M
Health and Human Services[11]	$0	$353K	$353K	$0	$425K	$425K
Liberal Arts and Sciences[12]	$1.3M	$1.6M	$1.8M	$2.3M	$2.8M	$3.3M
The Graduate School[13]	$0	$0	$0	$0	$0	$0
Total Cumulative Student Funding Support[14]	**> $4.5M**	**> $5.4M**	**> $6.1M**	**> $8.3M**	**> $9.8M**	**> $10.6M**

[6] Additional context for these student funding requests was not provided by the CoAA.

[7] BCOB plans to grow its graduate programs primarily at the master's level; therefore, the college assumes all new student resources will be generated by CBTI.

[8] CCI's student funding requests are primarily technology-related, such as annual investments to refresh, scale, and expand computing/storage capacities and services. These costs are separate from annual operating, support, and licensing costs for CCI computing services.

[9] Presumably, COE requested graduate assistants, which was calculated into dollar amounts (based on $18K per GA).

[10] Additional context for these student funding requests was not provided by the College of Engineering.

[11] CHHS requested student funding in the form of graduate assistants (18K per GA), in additional to GASP funding. In 2019, 16 additional doctoral graduate assistants plus GASP funding and five MS graduate assistants are requested. In 2024, 20 additional doctoral graduate assistants plus GASP funding and five MS graduate assistants are requested.

[12] CLAS focuses its student funding requests on graduate assistants and, in particular, increasingly competitive graduate assistantships. CLAS indicated that raising existing GA stipends to a more competitive level (minimum of $10K for master's and $16K for doctoral) has been a college priority for the past several years.

[13] Students in Graduate School programs will be enrolled in Professional Science Master's programs and, therefore, will be mostly self-paying. Any students support provided will come from the tuition increment.

[14] Requested funding is cumulative and not additive. That is, a total of $5.4 million is requested in 2019, and a total of $9.8 million is requested in 2024, not $15.2 million in 2024 ($5.2M+$9.8M).

Faculty Resource Requests

In order to achieve these enrollment goals, the following additional faculty resources are being requested.

Table 6. Faculty Lines Requested to Meet Enrollment Goals, by College

College	2019-2020 Goals			2024-2025 Goals		
	Low	Target	Stretch	Low	Target	Stretch
Art + Architecture[15]	1	1	1	3	3	3
Business[16]	2	10	12	3	12	15
Computing and Informatics[17]	22	22	22	44	44	44
Education	22	33	44	33	44	55
Engineering	9	17	26	17	26	42
Health and Human Services[18]	2	1.5	17.5	2	36.5	36.5
Liberal Arts and Sciences[19]	19	23	28	35	40	49
The Graduate School[20]	5	9	10	6	9	12
Total Cumulative Faculty Resource Requests	**82**	**133**	**161**	**143**	**215**	**257**

[15] These additional lines faculty lines will be needed to support the increased graduate enrollment. They would be tenure lines at the assistant professor level, with an anticipated average starting salary of $80,000 ($240,000 total required).

[16] In order for the BCOB to reach its 2019 goal of 1,000 graduate students, it would need 10 new faculty positions: seven tenure-track/ research faculty members and three clinical faculty members.

[17] CCI requested additional tenure-track faculty lines in order to achieve the projected enrollment. Projections for five years assume 20 new faculty lines: two BiG, 10 CS, and 10 SIS. Projections for ten years assume 40 new faculty lines: four BiG, 20 CS, 20 SIS.

[18] These faculty resources note the number of faculty positions (36.5 FTE) needed to increase the graduate student enrollment in CHHS. Five Full Professors ($645K); 11 Associate Professors ($1,135,200); and 20.5 Assistant Professors ($1,798,260) – 29% fringe included.

[19] The additional SCH produced by the target enrollments for five and 10 years suggests the need for 23 and 40 additional faculty members at those time points. (The projected need from departments was actually somewhat higher than these figures.) The amounts for the low and high goals were adjusted accordingly.

[20] For both the Health Informatics and DSBA programs, growth will be limited primarily by access to faculty. In theory, the program could expand class sizes, or reach out to adjunct faculty to create additional sections of popular courses to expand capacity. The reality is that for both the College of Health and Human Services and the College of Business, there are limitations due to respective accreditation standards. For the MHA program, class size is particularly important, and for the MBA and Business programs, there is a requirement for full-time faculty to teach courses. Full-time, tenured faculty are required for growth.

Staff Resource Requests

In order to achieve these enrollment goals, the following additional staff resources are being requested.

Table 7. Cumulative Staff Lines Requested to Meet Enrollment Goals, by College

College	2019-2020 Goals			2024-2025 Goals		
	Low	Target	Stretch	Low	Target	Stretch
Art + Architecture[21]	2	2	2	2	2	2
Business[22]	0	2	3	1	3	4
Computing and Informatics[23]	4	4	4	7	7	7
Education	12	18	24	18	24	30
Engineering	6	9	10	8	11	16
Health and Human Services[24]	2	8	8	2	11	11
Liberal Arts and Sciences[25]	1	5	9	1	5	9
The Graduate School[26]	2	3	3	2	3	3
Total Staff Resource Requests	**29**	**51**	**63**	**41**	**66**	**82**

[21] These staff positions are needed to support the MUD, which is located at the Center City Building (CCB), and the M.Arch. programs. At present, there is no direct staff support of any kind for the MUD Graduate Program Coordinator, faculty, or students at the CCB. Salary: $35,000. For the M.Arch. programs, this staff position is needed to support advising, recruitment, and the Graduate Program Coordinator. Salary: $35,000. Both positions are needed by 2019-20.

[22] BCOB will need three additional staff members to achieve its goal of 1000 students by 2019. These staff members will focus on recruiting out-of-market students for these programs.

[23] To support enrollment projections, additional staff positions are required. Projections for 2015 assume two new administrative staff positions and a new associate dean position. One administrative staff position will provide dedicated operational support to graduate program coordinators and facilitate student admission and matriculation processes. A second administrative staff position will centralize program assessment, recruitment, and retention activities while working with coordinators and faculty on program governance activities. The new associate dean position will allow the college to align leadership with its teaching, research, and service/administration/outreach activities. The college is currently filling a vacant associate dean position, targeting the primary duties for this position to oversight of academic programs. Additionally, research and service duties will be required of this associate dean. Adding a new associate dean position will allow the college to optimize roles and responsibilities of its associate deans, and thus, better support all of its academic programs. Projections for five years will require one additional staff position dedicated to student advising and progression, and to operate the internship programs that are a part of the PSMs. Projections for year 10 assume three additional staff positions to scale student support.

[24] In Year 1, CHHS will need an additional two staff (one administrative assistant and one Director of Assessment = $112,230); in Year 5, we will need six additional staff (two finance assistants and three administrative assistants = $233,490); in Year 10, we will need an additional three administrative assistants = $135,450). Fringe of 29% included.

[25] Several of the programs that are projecting growth indicated the need for additional support staff, and some of the interdisciplinary programs that expect growth are currently sharing a single staff member. The additional enrollments for five and 10 years require five and nine additional support staff.

[26] We have proposed a new combined Student Services Coordinator for the DSBA and HI programs to support day-to-day administrative needs and an Administrative Assistant to support the DSBA Program Director, the Graduate Center Director, and the larger DSBA Academic initiative. In addition, the PSM's requirement for professional skills/PLUS course, combined with the large enrollment and the cross-curricular nature of the programs, argues for a full-time Curriculum Specialist. That position would not only develop and deliver PLUS courses, but would also develop and coordinate interdisciplinary curricula within the program and between departments.

Additional Physical Resource Requirements

In order to achieve these enrollment goals, some colleges have indicated a need for additional physical space. Please refer to the individual college plans for complete details on the type of physical resources requested.

Table 8. Additional Physical Space Requested to Meet Enrollment Goals, by College

College	2019-2020 Goals			2024-2025 Goals		
	Low	Target	Stretch	Low	Target	Stretch
Art + Architecture[27]	None			Studio/Office Space		
Business[28]	14 CCB rooms/night	18 CCB rooms/night	20 CCB rooms/night	15 CCB rooms/night	20 CCB rooms/night	22 CCB rooms/night
Computing and Informatics[29]	25 offices; research laboratory, classroom, and server room space			50 offices; research laboratory, classroom, and server room space		
Education	12 rooms	18 rooms	24 rooms	18 rooms	24 rooms	30 rooms
Engineering	Yes	Yes	Yes	Yes	Yes	Yes
Health and Human Services[30]	4 rooms	34 rooms	34 rooms	4	66 rooms	66 rooms

[27] As the MUD and M.Arch. programs expand, the CoAA will need additional studio and faculty office space at the CCB and on campus. The additional space on campus may be gained through access to redesigned studio spaces in adjacent buildings.

[28] The BCOB needs additional classroom space at CCB. We currently have priority for nine classrooms after 5 p.m. We can usually get 12 classrooms, but have been turned down for more classrooms than that in the evening. There are 22 classrooms in the building, but no more than 17 total have ever been allocated to academic classes in the evening. We can begin to run classes during the day, but to do that in any size, we have to provide "hoteling" office space in CCB where faculty can work during the time between classes. The current cubicle system is inadequate because the open design of the space is not conducive to work which requires concentration/quiet. Faculty members note that the current layout of the cubicle space prevents them from doing tasks such as prepping class, conducting research, or writing anything more than simple emails. If we had reservable, private offices available, faculty members could teach at CCB during the day and evening and still be productive during the time between classes.

[29] To support CCI enrollment projections, substantial new physical (facility) resources are required. Currently, the college is at capacity for office space in Woodward Hall for faculty and staff. New office space (five to 10 offices) is necessary to support 2015 projections. A substantial expansion of office space (25 offices by year five; 25 additional offices by year ten) is necessary to support five- and 10-year projections. Research laboratory resources also must grow to support the five- and 10-year PhD student projections. (Current research laboratory space will support 2015 projections.) More analysis is needed to determine specific requirements for additional research space. A substantial increase in classroom space is required to accommodate the added instructional sections. Five- and 10-year projections will require additional instructional laboratories and server room space. More rigorous analysis is required to quantify these requirements.

[30] In the above table, office space (rooms) is indicated. Calculations were based on three graduate students/offices. Faculty and staff had individual offices for a grand total of 64 new office spaces. In addition to the office space, the SON graduate program will require an additional health assessment lab with live models and exam tables. The Kinesiology department would need an additional wet lab to accommodate faculty and student research. With the growth in public health graduate programs, the PHS Dept. will need a wet lab for environmental health.

Liberal Arts and Sciences[31]	Yes	Yes	Yes	Yes	Yes	Yes
The Graduate School[32]	Yes	Yes	Yes	Yes	Yes	Yes
Total Educational and Research Areas Requested[33]	**> 55**	**> 95**	**> 103**	**> 87**	**> 160**	**> 168**

[31] Space is needed for growth in all CLAS programs except, perhaps, the certificate programs. Chairs and directors indicate the need for additional office space for new faculty and GAs. The science departments (especially Chemistry and Geography & Earth Sciences) cite the need for more and improved lab space. CLAS has no additional space available and no new buildings are on the near-term horizon. No realistic estimate can be provided to provide the additional space for up to 500 new graduate students, 50 new faculty and nine staff across our nearly 50 graduate programs.

[32] A key obstacle for the interdisciplinary programs is the absence of a central location, a hub where faculty, students, and industry partners can work and collaborate. We will need a central administrative space, with faculty offices, and space for study and collaboration. In addition, an interdisciplinary lab space will be required so that all stakeholders have access to cutting-edge technology and software for research.

[33] Approximate and cumulative.

PORTFOLIO PRIORITIZATION STRATEGY OVERVIEW

If UNC Charlotte meets the target goals for 2019-20 and 2024-25, the percentage of graduate students that comprise the overall institutional class will be at 18% and 21%, respectively, assuming that the undergraduate enrollment increases, such that total enrollment at the University will be at 35,000 in both years (Table 9). If UNC Charlotte meets the high goals for those years, the percent of graduate students will be at 20% and 23%, respectively. Given that these figures are less than the 25% goal set forth by the Chancellor, this section aims to identify opportunities for the university to innovate in order to reach new markets, offer new program delivery models, and evaluate its academic portfolio to determine if a revision to the Chancellor's graduate enrollment goals is advisable.

As UNC Charlotte considers how to best enhance its graduate portfolio in an effort to both increase the overall number of graduate students and achieve the goal of increasing the ratio of graduate students to undergraduate students at the university, it should focus on expanding its current set of programs to new audiences through new delivery modalities and expanding its certificate offerings. These options are viable for the university because they allow for greater flexibility and experimentation while building upon the current portfolio rather than replacing the core offerings of graduate programs.

Table 9. Composition of Graduate Students in UNC Charlotte's Total Student Population

LOW GOALS	2013-14	2019-20	2024-25
Total Enrollments	26,584	35,000	35,000
Graduate Enrollments	5,068	5,311	6,014
% Graduate	**19%**	**15%**	**17%**

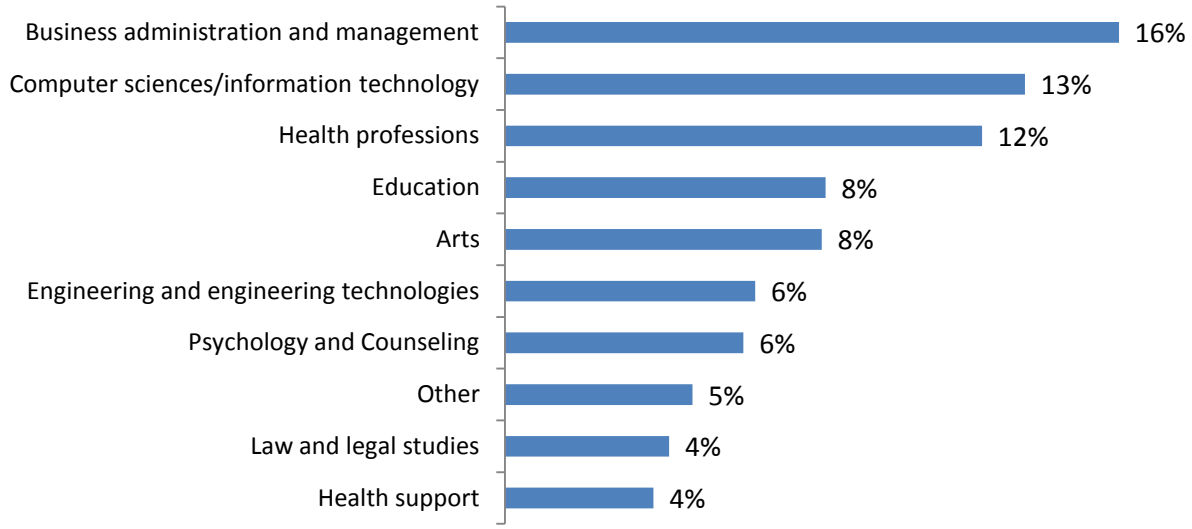
TARGET GOALS	2013-14	2019-20	2024-25
Total Enrollments	26,584	35,000	35,000
Graduate Enrollments	5,068	6,303	7,217
% Graduate	**19%**	**18%**	**21%**

HIGH GOALS	2013-14	2019-20	2024-25
Total Enrollments	26,584	35,000	35,000
Graduate Enrollments	5,068	7,217	8,209
% Graduate	**19%**	**20%**	**23%**

Program Prioritization by Degree Level and Discipline

In terms of program prioritization, Eduventures recommends that UNC Charlotte seriously consider expanding the current programs in business, computer science and information technology, and the health professions[34] to include online delivery. These are the top programs of interest among prospective adult learners[35] (Figure 5) and are similar to programs that prospective adult learners would like to pursue in an online format (refer to page 27 for information on online program interest). Another top program for expansion consideration should be counseling programs, as these have strong demand as well. Counseling is of less interest to prospective students in an online format; therefore, other modalities, such as hybrid, should be explored. Top programs tend to differ by degree level.[36] For example, doctoral programs with the most favorable market conditions typically are STEM fields, whereas top master's programs are within education.[37] The subsequent sections of this report outline the market opportunities for programs, by degree level.

Figure 5. Top 10 Programs of Interest Selected by Prospective Adult Learners (%)



Doctoral

The doctoral programs with the best market opportunity in North Carolina, based on a supply and demand factors, are focused on STEM fields, such as electrical engineering, biology, and computer and information sciences (Table 10). In fact, these top three doctoral programs are already in UNC

[34] Health professions includes disciplines such as public health, medicine, pharmacy, and nursing. These do not include health support professions.
[35] That is, adult learners who intend to obtain higher education in the next three years. Eduventures, 2013. "Consumer Preferences."
[36] Please refer to the Appendix, Program Prioritization by Graduate Level, on page 46 for a detailed breakdown of conferrals in North Carolina for the past five years by doctoral, master's, and certificate levels.
[37] Reflections on how the education market may change in the coming years due to changes in NC legislation are offered on page 18.

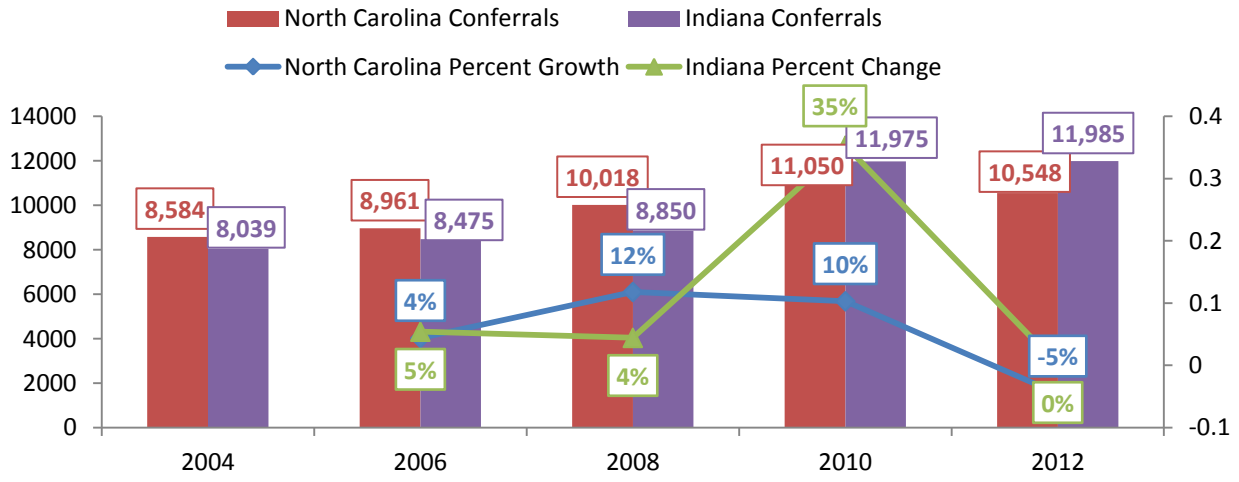
Charlotte's current portfolio, indicating that the university may have potential to expand these programs by increasing enrollments through new modalities or supplementing the current programs with similar disciplines. Among doctoral programs that UNC Charlotte already offers, counselor education, special education, and public health have the most favorable market conditions in the state, in addition to the three programs previously mentioned (Table 11).

Master's

At the master's level, STEM fields, such as information technology and computer science, have the most positive market opportunity (Table 12). Based on current data, education fields also appear to have positive market opportunity; however, given the recent legislative changes in the state of North Carolina, whereby teachers are no longer guaranteed a 10% pay increase upon receiving a master's degree in education and the fact that a master's degree is not required to teach in North Carolina, it is likely that interest in master's degrees in education will stagnate or even decrease. The University has already experienced enrollment declines in master's program in education (M.Ed. and M.A.T.).

Indiana is among a handful of states that underwent similar legislative changes. After the changes were implemented in 2011, graduate education enrollments quickly stagnated (Figure 6). While the state experienced dramatic growth in enrollments between 2008 and 2010, likely due to the recession, this growth came to a halt between 2010 and 2012, when growth was negligible. Further, the large public universities in the state, Indiana University and Purdue University, for example, experienced negative growth, where Indiana University Bloomington experienced a 17% decrease in graduate education enrollments between 2010 and 2012, after experiencing steady, positive growth between 2004 and 2010. In the Online Program Strategy section of this report, we outline suggested strategies for UNC Charlotte to develop its online program portfolio, both within education and outside, in order to stymie negative graduate enrollment growth.

Figure 6. Graduate Education Fall Enrollments in Indiana and North Carolina between 2004 and 2012[38]



[38] NCES IPEDS (2014).

Eduventures created a three-point, five-category scoring system to prioritize the recommended program areas for the graduate enrollment plan. For each category, the program is evaluated and scored on a scale of 1 to 3, with 1 being the lowest score and least ideal situation, while 3 is the highest score and the most favorable situation for that particular program's category. For example, the competition for doctoral programs in computer and information sciences is not favorable (1), indicating that there are a significant number of competitor institutions that offer programs in this area. Conversely, doctoral programs in textile sciences and engineering have more favorable competition (3), indicating that there are far fewer competitors for this discipline. The scores across the five categories are added to determine the total score. For more detailed information on the scoring system, please refer to the Appendix, Dashboard Scorecard, on page 54 for the detailed methodology behind these dashboards.

Table 10. Top 10 Doctoral Programs in North Carolina[39]

CIP Description	Supply to Demand	Competition	Market Size	Labor Demand	Fit in Portfolio	Total Score
Electrical and Electronics Engineering	3	1	3	3	1	11
Biology/Biological Sciences, General	3	1	3	3	1	11
Computer and Information Sciences, General	3	1	3	3	1	11
Textile Sciences and Engineering	3	3	3	2	0	11
Pharmaceutics and Drug Design	3	3	2	3	0	11
Materials Engineering	3	3	2	3	0	11
Computer Engineering, General	3	3	2	3	0	11
Science Teacher Education/General Science Teacher Education	3	3	2	3	0	11
Music, General	3	3	2	3	0	11
Pharmacy	3	1	3	3	0	10

Table 11. Top 10 Doctoral Programs in North Carolina, within UNC Charlotte's Current Portfolio[40]

CIP Description	Supply to Demand	Competition	Market Size	Labor Demand	Fit in Portfolio	Total Score
Electrical and Electronics Engineering	3	1	3	3	1	11
Biology/Biological Sciences, General	3	1	3	3	1	11
Computer and Information Sciences, General	3	1	3	3	1	11
Counselor Education/School Counseling and Guidance Services	3	1	3	2	1	10
Special Education and Teaching, General	3	1	2	3	1	10
Public Health, General	2	3	2	2	1	10
Optics/Optical Sciences	3	3	2	1	1	10

[39] Refer to Appendix, Dashboard Scorecard, on page 48 for the methodology behind this dashboard.

[40] UNC Charlotte's current portfolio in this dashboard is defined by having at least one degree conferral reported to the CIP code in 2012. The CIP codes to which UNC Charlotte reports degree conferrals were chosen by the university's Institutional Research unit.

Information Technology	2	3	1	3	1	10
Educational Leadership and Administration, General	1	1	3	3	1	9
Mechanical Engineering	1	1	3	3	1	9

Table 12. Top 10 Master's Programs in North Carolina[41]

CIP Description	Supply to Demand	Competition	Market Size	Labor Demand	Fit in Portfolio	Total Score
Information Technology	3	3	2	3	1	12
Teacher Education, Multiple Levels	3	3	2	3	1	12
Architecture	3	2	3	2	1	11
Computer Science	3	1	3	3	1	11
Elementary Education and Teaching	3	1	3	3	1	11
Mathematics Teacher Education	3	1	3	3	1	11
Teaching English as a Second or Foreign Language/ESL Language Instructor	3	1	3	3	1	11
Textile Sciences and Engineering	3	3	3	2	0	11
Manufacturing Engineering	3	3	2	3	0	11
Engineering/Industrial Management	3	3	2	2	1	11

Table 13. Top 10 Master's Programs in North Carolina, within UNC Charlotte's Current Portfolio[42]

CIP Description	Supply to Demand	Competition	Market Size	Labor Demand	Fit in Portfolio	Total Score
Information Technology	3	3	2	3	1	12
Teacher Education, Multiple Levels	3	3	2	3	1	12
Architecture	3	2	3	2	1	11
Computer Science	3	1	3	3	1	11
Elementary Education and Teaching	3	1	3	3	1	11
Mathematics Teacher Education	3	1	3	3	1	11
Teaching English as a Second or Foreign Language/ESL Language Instructor	3	1	3	3	1	11
Engineering/Industrial Management	3	3	2	2	1	11
Biology/Biological Sciences, General	3	1	3	3	1	11
Bioinformatics	3	2	2	3	1	11

[41] Refer to Appendix, Dashboard Scorecard, on page 48 for the methodology behind this dashboard.

[42] UNC Charlotte's current portfolio in this dashboard is defined by having at least one degree conferral reported to the CIP code in 2012. The CIP codes to which UNC Charlotte reports degree conferrals were chosen by the university's Institutional Research unit.

Certificates

Given that certificate programs are the least regulated in terms of getting approval for launching new programs, albeit the most regulated by the DOE for gainful employment, UNC Charlotte could expand its certificate portfolio as a strategy to increase graduate enrollments, especially if the certificate programs are offered online or even at an off-campus location in a cohort model. UNC Charlotte should focus on certificate programs that fit within its current suite of resources (particularly course offerings and faculty resources). While certificate information in IPEDS is less comprehensive than other degree levels,[43] the data reported in IPEDS in North Carolina were examined. Based on the available data, it appears that education, business, and nursing programs are the most viable areas in which UNC Charlotte could expand its certificate offerings. Further research needs to be conducted on the certificate market in North Carolina and surrounding states to better understand where there are gaps in the certificate programs that are being offered by competitors.

Table 14. Top 10 Certificate Programs in North Carolina[44]

CIP Description	Supply to Demand	Competition	Market Size	Labor Demand	Fit in Portfolio	Total Score
Teacher Education and Professional Development, Specific Levels and Methods, Other	3	3	3	1	1	11
Management Information Systems, General	3	3	3	2	0	11
Higher Education/Higher Education Administration	3	3	3	2	0	11
Mathematics Teacher Education	2	3	3	3	0	11
Educational/Instructional Technology	3	1	3	2	1	10
Clinical Nutrition/Nutritionist	3	3	3	1	0	10
Special Education and Teaching, General	3	3	2	2	0	10
Practical Nursing, Vocational Nursing and Nursing Assistants, Other	2	3	1	3	1	10
Educational Leadership and Administration, General	3	1	3	2	0	9
Family Practice Nurse/Nursing	3	1	3	2	0	9

[43] Please refer to the Appendix, Program Prioritization by Graduate Level, on page 46 for more information.
[44] Refer to Appendix, Dashboard Scorecard, on page 48 for the methodology behind this dashboard.

Table 15. Top Certificate Programs in North Carolina, within UNCC's Current Portfolio[45]

CIP Description	Supply to Demand	Competition	Market Size	Labor Demand	Fit in Portfolio	Total Score
Teacher Education and Professional Development, Specific Levels and Methods, Other	3	3	3	1	1	11
Educational/Instructional Technology	3	1	3	2	1	10
Practical Nursing, Vocational Nursing and Nursing Assistants, Other	2	3	1	3	1	10
English Language and Literature, General	2	3	1	2	1	9
Counselor Education/School Counseling and Guidance Services	2	1	2	2	1	8
Language Interpretation and Translation	1	3	2	1	1	8

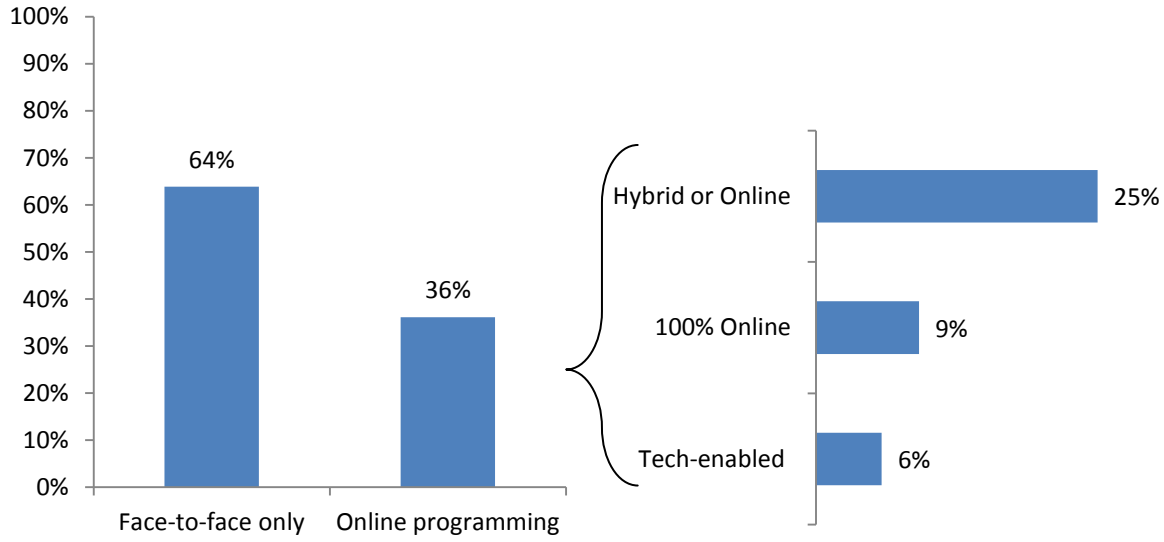
[45] UNC Charlotte's current portfolio in this dashboard is defined by having at least one degree conferral reported to the CIP code in 2012. The CIP codes to which UNC Charlotte reports degree conferrals were chosen by the university's Institutional Research unit.

Online Program Strategy[46]

The majority of UNC Charlotte's programs are offered solely in a face-to-face format (Figure 7). A smaller set of UNC Charlotte's programs are offered with some online programming: a quarter are offered hybrid or online, less than 10% are offered completely online, and 6% are tech-enabled (that is, offered through face-to-face and hybrid formats). Online programs can be a means to increase graduate enrollments for the University; however, a decision should first be made about the nature and purpose of online programs and how they align with the University's mission. If UNC Charlotte decides to move forward with expanding its online offerings, it should also consider how online programs fit within UNC Charlotte's current disciplines, the desired audience (regional vs. national), required investments, and faculty adoption. Three common strategies for online programming are:

- To supplement the face-to-face education.
- To reach new audiences, such as adult learners who seek more flexible and convenient formats to obtain their degree.
- To diversify the academic portfolio.

Figure 7. Distribution of UNC Charlotte's Graduate Programs, by Delivery Mode[47]



Supplement Face-to-Face

In order to accomplish the first strategy, UNC Charlotte should focus on examining the use of technology in courses that are currently tech-enabled and aim to develop these programs into fully hybrid and/or online formats. Given that the University does not need to receive approval from the state Legislature and UNC Board of Governors to develop new delivery modalities for existing programs, expanding its

[46] The Director of Distance Education, Dr. Dennis McElhoe, has reviewed this section and his comments have been incorporated accordingly.

[47] As selected by Graduate Program Directors in the first phase of data collection in February/March 2014.

online programming within its current academic portfolio can be a means to: 1) supplement the current face-to-face programs by enabling technology in the courses and programs, and 2) diversifying its portfolio by having an adequate representation of online programming to compliment its on-campus options. The same can be done with programs that are only offered in a face-to-face format, but seek methods to introduce technologies into the curricula.[48]

Reach New Audiences

Based on Eduventures analysis,[49] UNC Charlotte's region, the Southeast,[50] has a high intensity of online enrollment; 28% of online enrollments are concentrated in this region. That is, of all online enrollments in the United States, 28% comes from students who live in the Southeast. Further, institutions of UNC Charlotte's size represent about 20% of the regional market in terms of online providers; however, they command about 35% of the regional market in terms of online headcount. This indicates that UNC Charlotte will need to focus its online strategy on differentiating the University and its programs from the current providers in the market.

Given that UNC Charlotte does not currently offer many of its programs with online options, the University has opportunities to provide more online programs to North Carolinian students and potentially new out-of-state markets. In order to further assess the viability of expanding UNC Charlotte's online market within and beyond North Carolina, the University should build upon its brand analyses[51] by conducting market research to uncover markets that have demand for particular programs with little to no competition. UNC Charlotte should focus on the markets where it already has brand strength when considering where to expand its online program offerings. State Authorization[52] should also be considered when evaluating offering programs to out-of-state students. While UNC Charlotte is fully or partially authorized to admit students from 39 states, these regulations are modified regularly and should be monitored to ensure that the University is in compliance.

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[48] For more information on online pedagogy, please refer to the Eduventures report, *Online Higher Education – Moving From Ordinary to Extraordinary. Part 1: State of Play – Online Pedagogy at Leading Schools*.

[49] Eduventures, 2014. *Online Strategy Diagnostic Tool*.

[50] The Southeast is defined as North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Virginia, Louisiana, West Virginia, and Kentucky.

[51] The brand analyses performed for the University in the Charlotte region and across the Triad indicated that the brand awareness of UNC Charlotte was neutral.

[52] State Authorization is the federal regulation that requires institutions to comply with the regulations of individual states concerning marketing, recruitment and admission of student to distance education programs. While UNC Charlotte has worked to become fully or partially authorized to admit students from 39 states in the University's DE programs, State Authorization has nonetheless significantly impacted the ability of numerous institutions, not just UNC Charlotte, to grow enrollments by recruiting students from outside their home states.

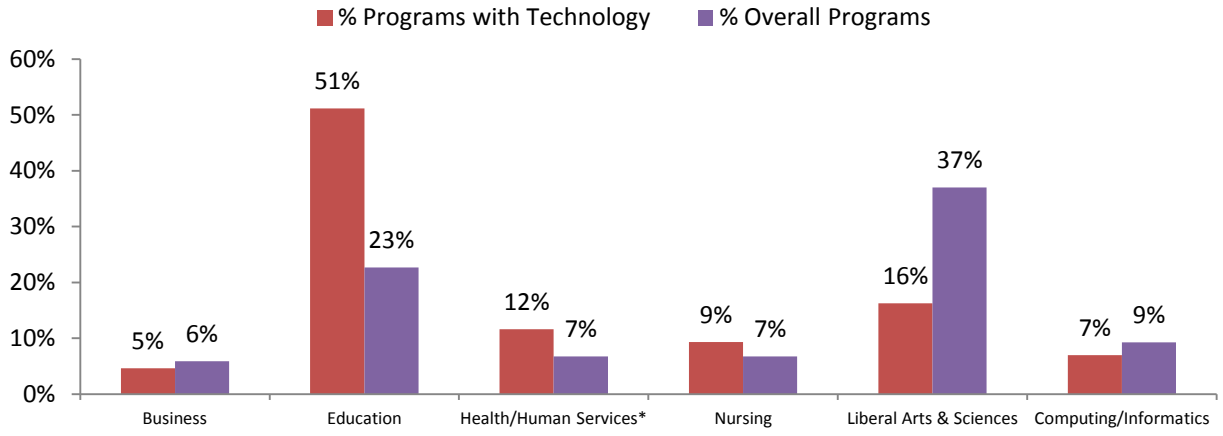
Table 16. Distribution of Online Learners in North Carolina and Its Surrounding States (Fall 2012 Enrollments)[53]

	Total Online Headcount	% Graduate Headcount	% Exclusively in Distance Education (DE) Courses[54]	Exclusively DE Students Located in Same State as Institution	Exclusively DE Students Not Located in Same State as Institution[55]
North Carolina	**80,638**	**18%**	**83%**	**91%**	**6%**
Georgia	63,400	21%	84%	70%	28%
South Carolina	21,613	23%	72%	91%	8%
Tennessee	32,458	25%	66%	83%	17%
Virginia	121,133	33%	91%	45%	52%

Diversify Academic Portfolio

UNC Charlotte's current portfolio of online programs is largely focused on programs offered by the College of Education (Figure 8), even though education programs comprise less than a quarter of UNC Charlotte's overall graduate portfolio. In the College of Liberal Arts and Sciences, 16% of programs are offered with an online component, even though it has the most programs in the university.

Figure 8. Percent of UNC Charlotte Programs with Online Programming, by College[56]



*Excluding Nursing, but includes Health Informatics.

[53] NCES IPEDS (2014).

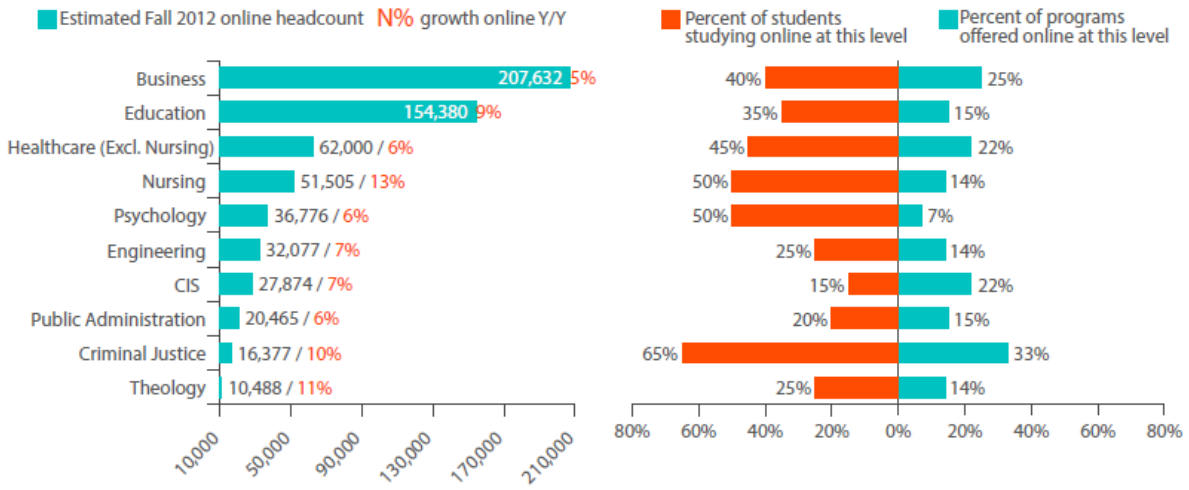
[54] Distance Education Course, as defined by NCES IPEDS, refers to a course in which the instructional content is delivered exclusively via distance education. Requirements for coming to campus for orientation, testing, or academic support services do not exclude a course from being classified as distance education. For more information on distance education definitions, please refer to the Eduventures and Sloan Consortium report, *Blending In: The Extent and Promise of Blended Education in the United States*.

[55] The location of a small subset of online students is unknown; therefore, "Exclusively DE Students Located in Same State as Institution" and "Exclusively DE Students Not Located in Same State as Institution" do not equal 100%.

[56] These data were provided by Graduate Program Directors in the first phase of data collection in February/March 2014.

This may be due to the types of programs that are offered within the College of Liberal Arts and Sciences; however, there are certain programs that are commonly offered through colleges of liberal arts and sciences that are heavily concentrated in online offerings, such as psychology, public administration, criminal justice, and theology (Figure 9).

Figure 9. At the Master's level, Business, Education, and Healthcare are most in demand and growing, with the highest saturation of online enrollments in Nursing, Psychology, and Criminal Justice.[57]

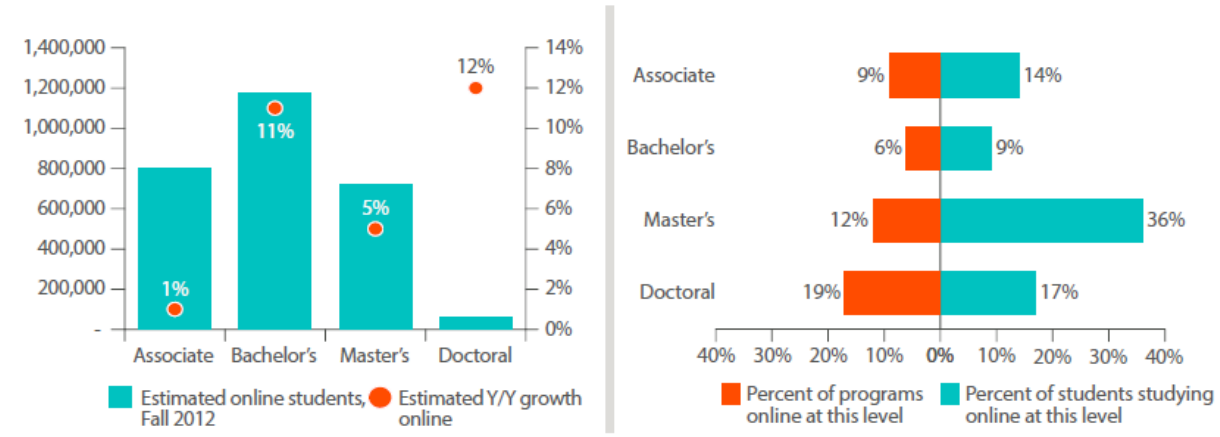


Source: Eduventures, Inc.

In terms of degree level, online master's degrees are the most popular among students (Figure 10 and Figure 11). Because master's programs tend to be shorter programs, the programs tend to have a more mature, driven student population and be focused more on application rather than theory. Therefore, UNC Charlotte should focus the movement of its graduate programs to online formats from its current master's program portfolio. Further, the University should focus on programs that are highly sought after by prospective students in an online format, such as business, computer science, and education (Figure 12). Prior to developing the expansion strategy, the University should conduct research on the current portfolio that is being offered by competing online providers to evaluate whether there are gaps that UNC Charlotte could easily fill with its current academic portfolio. One strategy for leveraging and potentially increasing its education enrollments could be to expand the marketing of its online education programs to teachers located in surrounding states. Three of North Carolina's surrounding states (Tennessee South Carolina, and Georgia) indicate that teachers with a master's degree earn more than teachers with just a bachelor's; however, it is unclear whether this is guaranteed. In order for this strategy to be viable, the licensing requirements for teachers in these states should be evaluated.

[57] Eduventures, 2014. "Seizing Opportunity, Navigating Risk: A Guide to the Evolving Online Market."

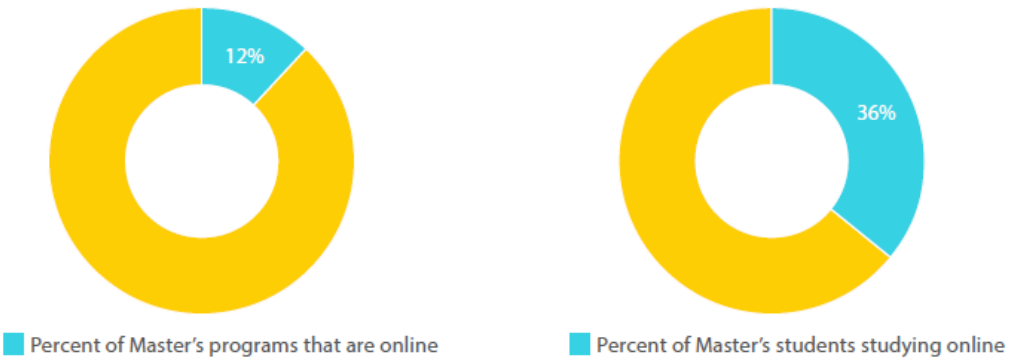
Figure 10. Online market growth has slowed this year, but master's still have by far the highest concentration of online students and degrees.[58]



Source: NCES, American Association of Community Colleges (for Associates estimates), National Student Clearinghouse, Eduventures analysis. "Est. Y/Y Growth" is calculated based on enrollment estimates from 2011 to 2012. "% of Students" refers to students studying online as compared to students across all higher education studying at this degree level. "% of Programs" refers to online programs compared to programs across all of higher education.

Source: Eduventures, Inc.

Figure 11. As of fall 2012, 12% of master's programs offered online enrolled 36% of all master's students.[59]

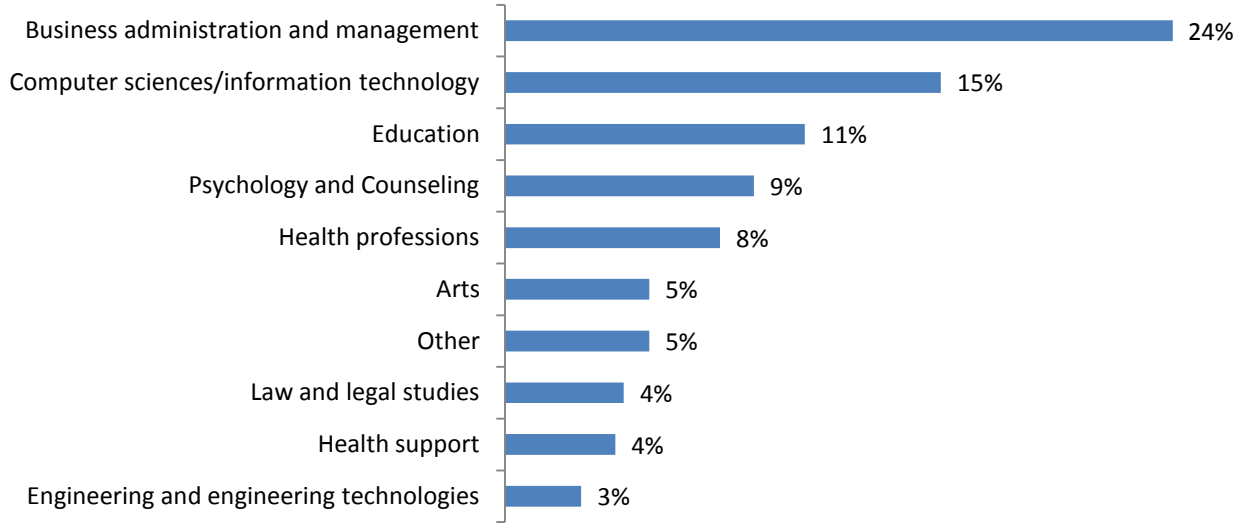


Source: NCES, Eduventures analysis.

Source: Eduventures, Inc.

[58] Eduventures, 2014. "Seizing Opportunity, Navigating Risk: A Guide to the Evolving Online Market."
[59] Eduventures, 2014. "Seizing Opportunity, Navigating Risk: A Guide to the Evolving Online Market."

Figure 12. Prospective Adult Learners' Programs of Interest in a 100% Online Format



CONCLUSIONS

This strategic graduate enrollment planning initiative represents a starting point for what we believe to be an important, ongoing University process. Our intent is to initiate a collaborative planning process involving graduate program directors, department chairs, deans, and the central administration to address the issues surrounding enrollment growth, funding, student success, the role of graduate education in research and economic development, the mix of graduate to undergraduate students, and the appropriate inventory and delivery of doctoral, master's, and certificate programs at the UNC Charlotte, North Carolina's Urban Research University.

The college graduate enrollment plans prepared by the responsible Graduate Program Directors and Department Chairs, reviewed by the Associate Deans, and approved by the College Deans, were reviewed by Eduventures and the Graduate School. We then rolled the college plans into an overall graduate enrollment plan for the University. Based on target enrollment goals set by each of the colleges, we project a graduate enrollment of 6,303 by 2019-20, an increase of 1,235 graduate students over the fall 2013 enrollment of 5,068 (an increase of 247 graduate students per year from now to 2019-20). The data also support a target enrollment projection of 7,217 graduate students in 10 years. The colleges were also asked to set both low and stretch goals for enrollment. When rolled up together, low goals project 5,311 graduate students for 2019-20 and 6,014 for 2024-25; stretch goals project 7,127 graduate students for 2019-20 and 8,209 for 2024-25.

Data indicate existing enrollment capacity at the master's level (including the graduate certificate level). Doctoral programs are at or near capacity, so enrollment will remain at fewer than 900 students until new doctoral programs are added to the University's inventory. We should also note the fact that while a program may have capacity to enroll additional students, growth may be limited by external demand for graduates as well as internal resources to support and retain students. New certificate programs may provide vehicles to increase enrollment and support future enrollment in master's degrees. Certificates also have the added benefit of rapid implementation, only requiring on-campus authority to establish. Professional master's and certificate programs with high external demand may serve as revenue sources for the University in addition to the applied academic benefits they provide for graduate education, so increasing capacity in selected programs may be strategically feasible (high student demand + low-cost University investment = high yield results).

The College of Education was the only college to project negative enrollments for the five- and 10-year goals. Education cites a number of challenges negatively impacting their ability to attract quality students to their programs, including recent legislative actions that affect teacher pay, struggling school system budgets that impact teacher hires, increased competition from local and regional institutions, and the proliferation of online programs by competitors. However, the College is committed to growth in graduate education and believes they can do so with innovative programming and the resources

necessary to implement these initiatives. A detailed description of the programs positioned to grow in the College of Education is presented in the Appendices.

We have some confidence that with the appropriate resources and a focused approach on long-term growth in graduate enrollments, the target goals can be achieved, particularly if the College of Education and the Belk College of Business can show positive enrollment growth. We have much less confidence that the stretch projections could be realized by 2019 and even less confidence in stretch projections that extend into 2024. Some colleges might be able to attain their stretch goals, but overall, we believe the current inventory of graduate degrees would not be sufficient to add 2,059 and 3,141 new graduate students by 2019 and 2024, respectively. We note that when we reach the target goal of 6,303 graduate students in 2019-20, this would represent 18% of the total headcount of the 35,000 students projected by 2020.

Access to additional resources to grow graduate enrollment will be required. In this study, we asked the question, "What resources are required in order (for the colleges) to reach their enrollment projections." We used four very broad categories of assets to obtain an idea of resources the programs believed to be necessary. While we did ask for dollar amounts and numbers of new faculty and staff, often there was no distinction made about the source of funding (e.g., enrollment increase, tuition increment, grants and contracts). As such, a more realistic approach is to think of resource allocation in each of the categories as *high*, *medium*, or *low* to support enrollment growth at the programmatic level. It should also be noted that programs often considered undergraduate enrollment projections as well as graduate in making this assessment. Detailed resource requests for the colleges can be found in the Appendices.

In general, the colleges identified new faculty lines as their most basic need. Each college expressed a requirement for at least two new lines to meet their target enrollment goal for 2024-25. The College of Computing and Informatics and the College of Education both projected a need for 44 new positions by 2024-25, while the College of Liberal Arts and Sciences proposed 40. Although not specified, we assume the new faculty would all be new tenure-track lines. The College of Business estimated 10 new faculty lines would be required to reach their target enrollment goal of 1,000 graduate students in 2019-20, including seven tenure-track and three clinical faculty. Collectively, 128 new faculty were requested for 2019-20 goals, with an additional 68 faculty needed to reach enrollment target goals for 2024-25. Using the current University Instructional Salary rate of $83,352, this would amount to $10,669,056 and $16,336,992, respectively.

The next requirement was student support funding. The projection to meet the 2019-20 enrollment target goal is $5.4 million, with an additional $4.4 million for 2024 (for a total need of $9.8 million). In most cases, the funds would be used to support graduate assistantships and tuition awards; however, the College of Computing and Informatics identified a requirement for $350K-$500K annually through 2024 for computing, storage, and network infrastructure to support their students' technical needs. The

Belk College of Business and the Graduate School did not request centralized student support funding. Instead, support would come from tuition increment resources.

The third category specified for resources was space/facilities. While it is difficult to calculate the cost, each college identified a demand for additional classroom, research, laboratory, and office space. The Belk College of Business requested additional classroom and office space in the Center City Building. For the other colleges, few specifics were given about where the facilities might be located or how much they would cost, but it will be important to continue to work with the colleges to increase their physical capacities to grow. For program delivery, it will be necessary to conduct an in-depth analysis of the potential for distance education, online programming, and blended formats to offset some of our physical space requirements for enrollment growth; the cost to develop courses for online delivery and student support for the online delivery will also have to be determined.

The demand for additional staff positions was a relatively low priority for the colleges in this exercise. New staff positions were requested primarily for administrative support for graduate programs (e.g., recruitment, program administration and advising, and professional development).

In this report, we do not attempt to make recommendations about which programs or colleges should receive specific allocations for meeting enrollment goals. Rather, our objective is to provide an evaluation of the University's potential to grow graduate enrollment that supports its mission and priorities, and what resources would be required to support this growth. Our analysis does show a high demand for resources, and it is clear that UNC Charlotte would have to expand its investment in graduate education in order to meet enrollment objectives.

Graduate education as a core function of North Carolina's Urban Research University is dedicated to the exploration and advancement of the limits of knowledge to not only serve society's social, technical, and professional needs, but also the need for intellectual expansion. As important as graduate education is to the vision and mission of the University, it is not currently an integral part of strategic planning; thus, the campus does not regularly perform a comprehensive review of the quality and effectiveness of our graduate programs. **To ensure the infrastructure necessary to strategically advance our mission and vision as a comprehensive research university, graduate education must be explicitly considered in all aspects of strategic planning, budgeting, and annual evaluation.**

RECOMMENDATIONS

We strongly recommend the University commit to graduate education as a strategic priority and integrate graduate enrollment management at the program, department, and college levels into the University's overall planning, evaluation, and resource allocation processes. To this end, we further recommend the implementation of an incentive-based budget process that includes practices and procedures for the appropriate and timely allocation of resources to support graduate education. Strategic planning, budgeting, evaluation and accountability, research opportunities, fundraising, and advocacy for graduate education must be strengthened to support near- and long-range graduate enrollment increases at the University of North Carolina at Charlotte.

RECOMMENDATION #1:

The first step towards integrating graduate enrollment into strategic planning is to conduct the graduate enrollment planning process on an annual basis and include the results in annual reports (at the department, college and university levels). We believe that the study completed here will serve as a valuable starting point to annually evaluate progress towards enrollment objectives. The Graduate School will partner with Institutional Research, ITS, and the colleges to develop a web-based system, *e*GEM (electronic Graduate Enrollment Management system), to deliver pre-populated (historic) data to Graduate Program Directors, Department Chairs, and College Associate Deans, and also to provide a data collection interface to input and manage enrollment projections. The metrics employed in graduate enrollment planning and annual evaluation can also support graduate program review.

Each graduate program has now developed plans for five- and 10-year enrollment projections consistent with their vision and mission statements along with a general resource needs assessment to achieve these goals. Using *e*GEM, programs can annually review their progress and make adjustments to their enrollment plans to meet future projections. These enrollment management plans can be analyzed at the department, college, division, and University levels so that as they evolve, a funding model that is transparent, nimble, and flexible may apply resources as appropriate to advance the University's mission and vision as a research university. In this way, UNC Charlotte can ensure that graduate education is a shared responsibility with portioned accountability using appropriate metrics to track success.

RECOMMENDATION #2:

Concurrent with integrating graduate enrollment planning into the strategic planning and annual evaluation processes, we propose the appointment of a Graduate Enrollment Management (GEM) Task Force to develop and recommend an incentive-based budget proposal along with procedures and guidelines to allocate resources for graduate education. Once completed, the enrollment planning and budget/resource allocation processes should be incorporated into the new strategic plans for the colleges, the Divisions of Research and Economic Development, Student Affairs, Academic Affairs, and the University.

APPENDICES

Roles and Responsibilities

The Graduate School

- Work with campus stakeholders (colleges, Institutional Research, ITS) to create a data collection/goal setting tool.
- Work with college deans to appoint college liaisons for the process.
- Work with Institutional Research to provide colleges and programs with accurate data.
- Work with college liaisons to establish timeline for the graduate enrollment planning process.
- Conduct regular check-ins with college liaisons to address questions during the process.
- Determine additional resources the Graduate School and programs need to support recruitment and retention to meet college goals (for new AND continuing students).
- Compile and validate each of the college enrollment plans.
- Submit final report to Provost/ Chancellor/ Board.
- Work with the Graduate Enrollment Management Workgroup to develop tactics and identify best practices for recruiting and retaining graduate students.
- Provide information on best practices for graduate enrollment planning to department chairs and college liaisons to support the enrollment planning process.

College Deans

- Work with the Graduate School to appoint a college liaison for the process.
- Set strategic priorities for the college, which informs enrollment strategy.
- Review college plans with college liaisons, and make necessary adjustments.
- Approve plans.

College Liaisons

- Work directly with the Graduate School to develop the timeline for the graduate enrollment planning process.
- Work directly with program directors and department chairs to ensure all data are submitted by deadline(s).
- Evaluate the graduate enrollments plans submitted by departments.
- Request additional information, as necessary, from program directors and department chairs.
- Prioritize resource requests at the department level and include additional college-level resource needs.
- Consolidate program/department plans into one college-wide enrollment plan.
- Have plan approved by college dean.
- Submit plan to the Graduate School.

Department Chairs

- Evaluate initial program goals submitted by program directors, and make necessary adjustments.
- Prioritize resource requests.
- Confer with college liaisons to provide additional department context/needs.
- Use data and information results to establish focused goals each for recruitment, retention, service, etc. and enrollment projection models.
- Develop the action plans followed by the appropriate faculty and staff determining the accountability measures and metrics to track.
- Implement the strategy, monitor the success of graduate enrollment plan, and make necessary adjustments.

Program Directors

- Update program details (program design and faculty).
- Set initial program goals.
- Propose programmatic resources requests.
- Confer with the department chairs to provide necessary context for goals and resource requests.

Institutional Research

- Supply accurate data (e.g., funding, enrollment funnel, progress to degree, graduation rates) for programs and colleges.

Program-Level Projections and Investment Requests

College of Arts + Architecture

Prepared by Dr. Lee E. Gray, Senior Associate Dean
Approved by Ken Lambla, Dean

Graduate Enrollment Projections, by Program

Program	2019-2020 Goals			2024-2025 Goals		
	Low	Target	Stretch	Low	Target	Stretch
M.Arch. I	40	50	60	50	60	70
M.Arch. II	30	40	50	40	50	60
M.Arch. III*	20	30	40	30	40	50
M.Arch./MUD	6	8	10	8	10	12
MUD	15	20	25	20	25	30
Total	**111**	**148**	**185**	**148**	**185**	**222**

*Note: The College of Arts + Architecture hopes to shift this new track into an independent degree program and enroll students no later than fall 2018 to meet national accreditation standards.

College-Level Resource Requests

Student funding support required

Program	2019-2020		2024-2025	
	SoA Funding	G.S. Funding	SoA Funding	G.S. Funding
M.Arch. I	$20,000	$72,000	$36,000	$90,000
M.Arch. II	$36,000	$90,000	$48,000	$112,000
M.Arch. III (MS)	$12,000	$36,000	$18,000	$48,000
M.Arch./MUD	-	-	-	-
MUD	$12,000	$36,000	$24,000	$42,000
Total	**$80,000**	**$234,000**	**$126,000**	**$292,000**

Faculty resources required

Program	2019-2020	2024-2025
M.Arch. I	1	-
M.Arch. II	-	1
M.Arch. III (MS)	-	1
M.Arch./MUD	-	-
MUD	-	-
Total	**1***	**2***

*Note: The additional faculty lines will be needed to support the increased graduate enrollment. They would be tenure lines at the assistant professor level with an anticipated average starting salary of $80,000 ($240,000 total required).

Staff resources required

Program	2019-2020	2024-2025
M.Arch. I	1**	-
M.Arch. II	-	-
M.Arch. III (MS)	-	-
M.Arch./MUD	-	-
MUD	-	-

*Note: This staff position is needed to support the MUD program, which is located at the Center City Building (CCB). At present, there is no direct staff support of any kind for the MUD Graduate Program Coordinator, faculty, or students at the CCB. Salary: $35,000.
**Note: This staff position is needed to support the M.Arch. programs with regard to advising and recruitment and to support the Graduate Program Coordinator. Salary: $35,000.

Physical resources required

Program	2019-2020	2024-2025
M.Arch. I	-	-
M.Arch. II	-	Studio/Office Space*
M.Arch. III (MS)	-	-
M.Arch./MUD	-	-
MUD	-	Studio/Office Space**

*Note: As the MUD program expands, we will need additional studio and faculty office space at the CCB.
**Note: As the M.Arch. programs expand, we will need additional studio and faculty office space on campus. This additional space may be gained through access to redesigned studio spaces in adjacent buildings.

Belk College of Business

Prepared by Richard Buttimer, Associate Dean
Approved by Steven Ott, Dean

Graduate Enrollment Projections, by Program

Potential Growth by 2020

Program	Track	2020 Target
MBA	Part-Time	350
	Cohort/Innovation	40
MACC	CPA Track	130
	Tax Track (or M. Tax)	40
MS Math-Finance	Risk Management	50
	Financial Data Analytics	50
	Computational Finance	50
MS Econ	Economics/Econometrics Tracks	30
	Finance Tracks	50
MS Real Estate		30

PhD Finance		20
DBA		40
Management MS	(could be MBA variant)	75
Marketing MS	(could be MBA variant)	75
Total		1030

College-Level Resource Requests

Additional Information That Affects Enrollment Projections[60]

1. If enrollments are to be limited, describe the restrictions and the reasons for them.

We can grow from our current enrollments of 635 graduate students to about 675 students with current resources. Beyond that, we will need new resources. Required resources will include additional faculty and additional classroom space at CCB.

2. Indicate any new faculty positions/resources required to achieve the enrollment projections.

To achieve our target goal of 1000 graduate students by 2019, we will need 10 new faculty positions: seven tenure-track/research faculty members and three clinical faculty members.

3. Indicate any new student resources required to achieve the enrollment projections.

Our plan is to grow our graduate programs primarily at the master's level. We assume that all new student resources (such as scholarships or assistantships) will be generated by CBTI, and thus need no new student resources for this expansion.

4. Indicate any new support (staff) resources required to achieve the enrollment projections.

We will need three additional staff members to achieve our goal of 1000 students by 2019. These staff members will focus on recruiting out-of-market students for these programs.

5. Indicate any new physical (facility) resources required to achieve the enrollment projections.

We need additional classroom space at CCB. We currently have priority for nine classrooms, after 5 p.m. We can usually get 12 classrooms, but have been turned down for more classrooms that that in the evening. There are 22 classrooms in the building, but no more than 17 total have ever been allocated to academic classes in the evening. We can begin to run classes during the day, but to do that in any size, we have to provide "hoteling" office space in CCB where faculty can work during the time between classes. The current cubicle system is inadequate because the open design of the space is not conducive to work which requires concentration/quiet. Faculty members note that the current layout of the cubicle space prevents them from doing tasks such as prepping class, conducting research, or writing anything more than simple emails. If we had reservable, private offices available, faculty members could teach at CCB during the day and evening and still be productive during the time between classes.

6. Provide additional context as needed herein.

We believe that there is sufficient market demand to allow us to grow to 1000 graduate students (a 57% increase over our current enrollment of 635) by 2019. We have a demonstrated track record of strong growth in our graduate programs, and we have identified specific areas where we believe there is demand. The Belk College is highly efficient at generating both student credit hours (including graduate

[60] For additional details on the Belk College of Business' projections and resource requests, please refer to the appendix entitled, "Appendix_UNCC 2014 Graduate Enrollment Plan_Belk College of Business."

student credit hours) because we are able to teach in large sections and with very low ancillary costs (i.e., we do not need labs or other specialized equipment). To achieve this growth, we would need a modest increase in faculty and more access to classrooms in the CCB.

College of Computing and Informatics

Prepared by William J. Tolone, Associate Dean
Approved by Yi Deng, Dean

Graduate Enrollment Projections

		2019-2020 Goals			2024-2025 Goals		
Program	**Level**	Low	Target	Stretch	Low	Target	Stretch
Bioinformatics Apps	Certificate	12	24	26	24	28	30
Bioinformatics	Master's PSM	45	55	60	55	65	75
Bioinformatics	Doctoral	24	28	30	26	32	35
Bioinformatics Tech	Certificate	10	12	15	10	12	15
Health Informatics	Master's PSM	80	100	110	100	110	125
Health Informatics	Certificate	27	33	36	33	36	41
Computing & Info Systems	Doctoral CAIS	140	155	170	185	205	225
Computing & Info Systems	*Doctoral CS track*	*79*	*87*	*96*	*102*	*112*	*123*
Computing & Info Systems	*Doctoral SIS track*	*61*	*68*	*74*	*83*	*93*	*102*
Computing & Info Systems	*Doctoral BISOM track*[61]						
Computer Science	Master's	280	300	320	400	425	450
Architecture Dual Degree	Master's CS and SIS[62]						
Adv Database/Know Disc	Certificate	17	18	20	18	20	22
DSBA	Master's PSM	100	125	150	220	250	280
DSBA	Certificate	60	80	100	80	100	120
Mgt of Info Tech	Certificate	5	7	9	5	7	10
Game Design & Dev	Certificate	8	12	15	10	15	20
Info Security/Privacy	Certificate	12	14	16	12	15	18
Information Technology	Master's	150	180	200	225	250	275
Total		**970**	**1143**	**1277**	**1403**	**1570**	**1741**

College-Level Resource Requests

Additional Information that Affects Enrollment Projections

[61] BISOM analysis included in BCOB.
[62] Dual Degree students are enrolled in either MSCS or MSIT.

1. If enrollments are to be limited, describe the restrictions and the reasons for them.

CCI graduate enrollment is limited not by projected demand, but by resourcing (i.e., faculty, staff, student and physical).

2. Indicate any new faculty positions/resources required to achieve the enrollment projections.

To hit enrollment projections, additional tenure-track faculty lines are required. Projections for 2015 assume five new faculty lines. Projections for five years assume 20 (5+17) new faculty lines – two BiG, 10 CS, and 10 SIS. Projections for 10 years assume forty (5+17+22) new faculty lines – four BiG, 20 CS, and 20 SIS. Note: While some part-time/adjunct faculty can be leveraged to support the increased enrollment, this is not a robust strategy for graduate enrollment growth.

3. Indicate any new student resources required to achieve the enrollment projections.

For CCI, student resources are primarily technical in nature. Projections for 2015 assume a $750K investment in computing, storage, and network infrastructure. Projections for five years assume annual investment (years 2-5) of $350K to refresh, scale and expand computing/storage capacities and services. Projections for 10 years assume annual investment (years 6-10) of $500K to refresh, scale, and expand computing/storage capacities and services. These costs are separate from annual operating, support and licensing costs for CCI computing services.

4. Indicate any new support (staff) resources required to achieve the enrollment projections.

To support enrollment projections, additional staff positions are required. Projections for 2015 assume two new administrative staff positions and a new associate dean position. One administrative staff position will provide dedicated operational support to graduate program coordinators and facilitate student admission and matriculation processes. A second administrative staff position will centralize program assessment, recruitment, and retention activities while working with coordinators and faculty on program governance activities. The new associate dean position will allow the college to align leadership with its teaching, research, and service/administration/outreach activities. The college is currently filling a vacant associate dean position – targeting the primary duties for this position to oversight of academic programs. Additionally, research and service duties will be required of this associate dean. Adding a new associate dean position will allow the college to optimize roles and responsibilities of its associate deans, and thus better support all of its academic programs. Projections for five years will require one additional staff position dedicated to student advising and progression, and to operate the internship programs that are a part of the PSMs. Projections for year 10 assume three additional staff positions to scale student support.

5. Indicate any new physical (facility) resources required to achieve the enrollment projections.

To support CCI enrollment projections, substantial new physical (facility) resources are required. Currently, the college is at capacity for office space in Woodward Hall for faculty and staff. New office space (five to 10 offices) is necessary to support 2015 projections. A substantial expansion of office space (25 offices by year five; 25 additional offices by year ten) is necessary to support five- and 10-year projections. Research laboratory resources also must grow to support the five- and 10-year PhD student projections. (Current research laboratory space will support 2015 projections.) More analysis is needed to determine specific requirements for additional research space. A substantial increase in classroom space is required to accommodate the added instructional sections. Five- and 10-year projections will require additional instructional laboratories and server room space. More rigorous analysis is required to quantify these requirements.

6. Provide additional context as needed herein.

See the attached spreadsheet for graduate program specific enrollment projections.

College of Education

Prepared by Dawson R. Hancock, Associate Dean
Approved by Ellen McIntyre, Dean

Graduate Enrollment Projections, by Program

		2019-2020 Goals			2024-2025 Goals		
Program	**Level**	Low	Target	Stretch	Low	Target	Stretch
Autism Spectrum Disorders	Certificate	38	41	44	41	44	47
Teaching Engl as 2nd Lang	Master's	115	118	121	118	121	124
School Counseling	Certificate	12	14	16	14	16	18
Child & Family Studies	Master's	6	8	10	8	10	12
Instructional Sys Tech	Certificate	18	20	22	20	22	24
Instructional Sys Tech	Master's	8	10	12	10	12	14
Counseling	Master's	117	120	123	120	123	126
Counseling	Doctoral	9	11	13	11	13	15
Curriculum & Instruction	Doctoral	12	14	16	14	16	18
Educational Leadership	Doctoral	10	12	14	12	14	16
Elementary Education	Master's	25	27	29	27	29	31
Elementary School Mathematics	Certificate	13	15	17	15	17	19
Child & Family Devl	Certificate	14	16	18	16	18	20
Art Education(K-12)	Master's	9	11	13	11	13	15
Early Childhood Ed (B-K)	Master's	8	10	12	10	12	14
Elementary Education	Master's	25	27	29	27	29	31
English as 2nd Lang(K-12)	Master's	27	29	31	29	31	33
Foreign Language Education	Master's	9	10	11	10	11	12
Middle Grades & Sec Educ	Master's	118	121	124	121	124	127
Middle Grades Ed (6-9)	Master's	12	14	16	14	16	18
Secondary Educ (9-12)	Master's	12	14	16	14	16	18
Special Education (K-12)	Master's	20	22	24	22	24	28
Play Therapy	Certificate	8	10	12	10	12	14
Alternative Licensing Cnt	UND	37	39	41	39	41	43
Reading Education	Master's	12	14	16	14	16	18
School Administration	Master's	12	14	16	14	16	18
School Admin	Certificate	14	16	18	16	18	20
Spec Ed-Acad-Int Gift	Certificate	8	10	12	10	12	14
Special Education	Master's	12	14	16	14	16	18
Special Education	Doctoral	4	5	6	5	6	7

Subs Abuse Counseling	Certificate	12	14	16	14	16	18
Teaching	Certificate	617	619	621	619	621	623
Teacher Licensure-Spec Ed	UND	12	14	16	14	16	18
Total		**1,385**	**1,453**	**1,521**	**1,453**	**1,521**	**1,591**

College-Level Resource Requests

Information that Affects Enrollment Projections

The College of Education enrolls over 3000 undergraduate and graduate students in professional education programs. Our programs are nationally accredited (NCATE, CACREP) and approved by the North Carolina Department of Public Instruction. Energetic, responsive, fast-growing, diverse, and effective are adjectives that describe the College and the faculty and staff who support our programs. We serve traditional and non-traditional students on campus, online, and at distance education sites throughout the region. Completers of our programs routinely report that their experiences in our College are challenging and meaningful and lead to rewarding careers in teaching, counseling, and educational leadership in both school and non-school settings.

Although the College's accomplishments have been many, we are currently encountering significant challenges that are negatively impacting our ability to attract high-quality students to our programs. One challenge has been the increase in the number of institutions of higher education in our region that are attracting potential candidates. Many of these institutions are attractive to some candidates because they have fewer requirements for graduation. For example, in the past five years, Wingate University has created education programs, many of which offer virtually open enrollment, that have directly impacted our ability to attract new students. Similarly, Boston-based Northeastern University has established satellite sites in the Charlotte area that are siphoning students away from our education programs. Even our sister State institutions (e.g., North Carolina State University, Appalachian State University) have established distance education locations in the geographic vicinity of Charlotte that has traditionally been served exclusively by UNC Charlotte.

In addition to the traditionally delivered programs, there has been a proliferation of 100%-online programs that are attracting some students who would otherwise enroll in our education programs. For example, in the past few years, the University of Phoenix, Nova, Capella, DeVry, and Walden Universities have created 100%-online education programs at the graduate levels that have directly challenged our ability to attract candidates, even to our 100%-online and hybrid programs. Ironically, we have even found ourselves competing for students who enroll in online programs offered by our sister institutions in the UNC system (e.g., East Carolina University, Western Carolina University).

Recent legislative mandates in North Carolina have made it difficult to attract graduate students, also. For example, our elected officials recently eliminated the 10% pay increase historically associated with attainment of an M.Ed. degree in a teaching field. This change has resulted in a precipitous decline in enrollment in our M.Ed. programs by teachers with bachelor degrees. The lack of pay increases the past few years for all teachers in North Carolina has also detracted from our goal of preparing more and better teachers to support the educational needs of future generations of schoolchildren.

It is in light of this context that the College of Education appreciates the Graduate School's current efforts to identify specific areas in which we need support and resources with which to attract new

students to our graduate programs. Furthermore, we appreciate Eduventures' efforts to provide information with which we can make data-based decisions about programs that we would like to grow in the future. Like our Chancellor, we are committed to increasing the percentage of graduate student enrollment in our College to 35% in future years. Although not exhaustive, the list of programs identified below identifies the areas that we believe are best positioned to grow in the near and long term if provided appropriate quantities of faculty, students, staff, and space.

Teaching English as a Second Language – Data provided by the U.S. Bureau of Labor Statistics indicate that the number of English language learners in North Carolina will increase significantly in the next decade. The increase in the number of school-age children for whom English is not their native language will necessitate a need for more teachers prepared to meet the educational needs of these children. Furthermore, as evidenced by the data provided by Eduventures, the 17% projected growth in jobs from 2012 to 2022 of people who need the support of teachers with skills in teaching English as a second language suggests that additional faculty, staff, and space will be required at UNC Charlotte in this area. Because only five institutions of higher education in North Carolina provide advanced degrees in this area, UNC Charlotte is well positioned to be able to attract many new candidates into this program. Based on these data, the table below depicts the College of Education's specific needs in order to increase enrollments in Teaching English as a Second Language.

Teaching English as a Second Language Totals

	Low Goals		Target Goals		Stretch Goals	
Projections	5 Years	10 Years	5 Years	10 Years	5 Years	10 Years
Fall Enrollment Goals	115	118	118	121	121	124
Faculty resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	4	6	6	8	8	10
Student resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Staff resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Physical resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2 rms	3 rms	3 rms	4 rms	4 rms	5 rms

Autism Spectrum Disorders – Data produced by the National Institute of Mental Health recently revealed that as many as 1 in every 60 children in the U.S. has an autism spectrum disorder. This statistic represents a significant increase in the number of children diagnosed with a disorder in the last twenty years. Locally derived data suggest that the incidence rate in North Carolina may be even more profound than the national average. These national and state data reveal the strong need for teachers with expertise in working with children with autism spectrum disorders. In addition, data produced by Eduventures project an 11% increase in the next 10 years in the number of jobs that will be needed in North Carolina in areas related to autism spectrum disorders. Because few institutions of higher learning in our state offer educational programs in this area, UNC Charlotte is well positioned to capitalize on the growing demand for teachers with expertise in autism spectrum disorders. Based on these data, the table below depicts the College of Education's specific needs in order to increase enrollments in Autism Spectrum Disorders.

Autism Spectrum Disorder Totals

Projections	Low Goals		Target Goals		Stretch Goals	
	5 Years	10 Years	5 Years	10 Years	5 Years	10 Years
Fall Enrollment Goals	38	41	41	44	44	47
Faculty resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	4	6	6	8	8	10
Student resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Staff resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Physical resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2 rms	3 rms	3 rms	4 rms	4 rms	5 rms

Counseling – School counselors are retiring or leaving the profession in North Carolina at a faster rate than institutions of higher education are able to replace them. In addition, national statistics reveal that the need for professional counselors to work with victims of abuse, drug and alcohol addiction, and mental health issues is growing exponentially. As revealed by the data provided by Eduventures, the need for professional counselors will grow in North Carolina alone by 16% in the next ten years. Both the school track and the clinical mental health track of our counseling program are extremely popular. Unfortunately, with our current quantities of faculty, staff, and space, we are able to admit only one-half of the qualified candidates who apply for admission to our Counseling program each year. With increases in resources with which to support the demand for our Counseling program, we could significantly increase our enrollment figures in order to achieve the "high goals" depicted in the table below.

Counseling Totals

Projections	Low Goals		Target Goals		Stretch Goals	
	5 Years	10 Years	5 Years	10 Years	5 Years	10 Years
Fall Enrollment Goals	117	120	120	123	123	126
Faculty resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	4	6	6	8	8	10
Student resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Staff resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Physical resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2 rms	3 rms	3 rms	4 rms	4 rms	5 rms

Educational Leadership (Higher Education) – The community track of the College of Education's EdD in Educational Leadership program was created in 2005 in response to community demands for an opportunity for middle to high-level organizational leaders in non-school settings to acquire the knowledge and skills necessary to perform well in their work environments. The program has been extremely well received and exists as the only one of its kind at a public university within a 90-mile

radius of Charlotte. Since 2005, we have admitted approximately 10 professionals per year from the health fields, banking communities, two- and four-year institutions of higher education, religious organizations, and non-profit agencies. Unfortunately, during that period, we have been able to hire only two faculty members to support the program. As a result, as revealed by the data provided by Eduventures, the number of degrees produced in 2012 in this field by UNC Charlotte was only nine of the 111 degrees offered in the state. With the additional faculty and space identified in the table below, the community track of the EdD in Educational Leadership at UNC Charlotte would have the capacity to enroll and graduate at least twice as many students per year.

Educational Leadership (Higher Education) Totals

	Low Goals		Target Goals		Stretch Goals	
Projections	5 Years	10 Years	5 Years	10 Years	5 Years	10 Years
Fall Enrollment Goals	10	12	12	14	14	16
Faculty resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	4	6	6	8	8	10
Student resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	4	6	6	8	8	10
Staff resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Physical resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2 rms	3 rms	3 rms	4 rms	4 rms	5 rms

Master of Arts in Teaching/Graduate Certificate in Elementary Education – The MAT/Graduate Certificate Program in elementary education is designed for those candidates who hold an undergraduate degree in a field other than elementary education. Building on a candidate's bachelor's degree, the MAT focuses primarily on developing and extending the pedagogical, leadership, and research skills needed by teachers. Demand for this program at UNC Charlotte has been significant, and the data produced by Eduventures indicate a 19% increase in the quantity of jobs in this field by 2022. Because our enrollments have been strong and because school districts in the state will need additional teachers in this field in the years ahead, the College of Education will require the following additional resources to meet the state-wide demand.

Master of Arts in Teaching/Graduate Certificate in Elementary Education Totals

	Low Goals		Target Goals		Stretch Goals	
Projections	5 Years	10 Years	5 Years	10 Years	5 Years	10 Years
Fall Enrollment Goals	13	15	15	17	17	19
Faculty resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Student resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Staff resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Physical resources required?	Yes	Yes	Yes	Yes	Yes	Yes

If YES, amount?	2 rms	3 rms	3 rms	4 rms	4 rms	5 rms

MEd in Middle and Secondary Education (Science, Technology, Engineering, and Mathematics - STEM) – The United States has become a global leader in part through the contributions of its scientists, technology experts, engineers, and mathematicians. Yet today, as reported recently by the U.S. Department of Education, that position has been threatened as comparatively few U.S. students pursue expertise in the fields of science, technology, engineering, and mathematics and due to an inadequate pipeline of teachers skilled in those subjects. As indicated by the data provided by Eduventures, the demand for teachers and specialists in these areas will increase in North Carolina in the years ahead. In response to this need, one of the strategic goals of the College of Education has been to prepare more students with the knowledge and skills in these areas. In order to accomplish this goal, we project the need for the resources identified in the table below.

MEd in Middle and Secondary Education (Science, Technology, Engineering, and Mathematics - STEM) Totals

	Low Goals		Target Goals		Stretch Goals	
Projections	5 Years	10 Years	5 Years	10 Years	5 Years	10 Years
Fall Enrollment Goals	118	121	121	124	124	127
Faculty resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	4	6	6	8	8	10
Student resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Staff resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2	3	3	4	4	5
Physical resources required?	Yes	Yes	Yes	Yes	Yes	Yes
If YES, amount?	2 rms	3 rms	3 rms	4 rms	4 rms	5 rms

The William States Lee College of Engineering

Prepared by Ron Smelser, Associate Dean, College of Engineering and Johnna Watson, Associate Dean, The Graduate School
Approved by Robert E. Johnson, Dean

Graduate Enrollment Projections, by Program

		2019-2020 Goals			2024-2025 Goals		
Program	**Level**	Low	Target	Stretch	Low	Target	Stretch
Engineering Management	MS	80	80	80	100	100	100
Construction and Facilities Management	MS	25	35	45	30	45	60
Civil Engineering	MSCE	58	70	90	61	89	143
Electrical Engineering	PHD	110	110	110	150	150	150
Electrical Engineering	MSEE	275	275	275	320	320	320
Infrastructure and Environmental Engineering	PHD	45	60	75	50	70	90
Applied Energy and Electromechanical Systems	MS	15	28	35	20	40	60
Fire Protection and Administration	M	10	20	25	15	25	35

Mechanical Engineering	PHD	64	64	64	74	74	74
Mechanical Engineering	MSME	90	90	90	120	120	120
Engineering	MSE	8	8	8	8	8	8
Lean Six Sigma	CERT	5	5	5	5	5	5
Logistics and Supply Chains	CERT	5	5	5	5	5	5
Energy Systems	CERT	5	5	5	5	5	5
TOTAL		795	855	912	963	1056	1175

College-Level Resource Requests

Detailed college-level resource requests were not provided by the College of Engineering.

College of Health and Human Services

Prepared by Jane Neese, Associate Dean for Academic Affairs
Approved by Nancy L. Fey-Yensan, Dean

Graduate Enrollment Projections, by Program

Program Name	Level	2019-2020 Goals	2024-2025 Goals
Community Health	Certificate	7	10
Health Administration	Master's	60	60
Health Services Research	Doctoral	23	31
Kinesiology	Master's	50	60
Public Health	Master's		
Nursing Advanced Clinical	Master's	91	97
Nursing Anesthesia	Master's	40	40
Nurs Anesthesia	Certificate		
Family Nur Prac	Certificate		
Nursing Admin	Certificate		
Nursing Education	Certificate		
Nursing Practice	Doctoral		
Nurs Systems/Populations	Master's	95	105
Nurs Systems/Populations	Certificate	20	26
Social Work	Master's	80	115
Public Health Sciences	Doctoral	20	40
Public Health Core Concepts	Certificate	10	15
Nursing Advanced Clinical	Certificate	6	6
Total		**502**	**605**

College-Level Resource Requests

Additional Information That Affects Enrollment Projections

1. If enrollments are to be limited, describe the restrictions and the reasons for them.

The Department of Public Health Sciences aspires to become a School of PH, which would require an additional four new master's concentrations and two new doctoral concentrations; collectively, 16 additional faculty are required to staff these concentrations. Thus, without additional resources, the graduate programs in Public Health Sciences will not grow. Several programs in nursing and social work will not grow without faculty as well as additional clinical sites.

2. Indicate any new faculty positions/resources required to achieve the enrollment projections.

The above faculty resources note the number of faculty positions (35.5 FTE) needed to increase the graduate student enrollment in CHHS. Five Full Professors ($645K); 11 Associate Professors ($1,135,200); and 20.5 Assistant Professors ($1,798,260) – 29% fringe included.

3. Indicate any new student resources required to achieve the enrollment projections.

In Year 1, two additional doctoral graduate assistants are needed ($36K) + GASP funding; in Year 5, we will need 16 additional doctoral graduate assistants + GASP funding and five MS graduate assistants (total = $353K); in Year 10, we will need an additional 20 doctoral graduate assistants + GASP funding and five MS graduate assistants ($425K)

4. Indicate any new support (staff) resources required to achieve the enrollment projections.

In Year 1, we will need an addition two staff (one administrative assistant and one Director of Assessment = $112,230); In Year 5 we will need six additional staff (two finance assistants and three administrative assistants = $233,490); in Year 10, we will need an additional three administrative assistants = $135,450). Fringe of 29% included.

5. Indicate any new physical (facility) resources required to achieve the enrollment projections.

In the above table, office space (rooms) is indicated. Calculations were based on three graduate students/office. Faculty and staff had individual offices for a grand total of 64 new office spaces. In addition to the office space, the SON graduate program will require an additional health assessment lab with live models and exam tables. The Kinesiology department would need an additional wet lab to accommodate faculty and student research. With the growth in public health graduate programs, the PHS Dept. will need a wet lab for environmental health.

6. Provide additional context as needed herein.

Most CHHS masters programs require external educational experiences such as internships or practica, which require staff to track contractual agreements with external agencies. In addition, growth in programs may be hindered by lack of available placement sites for students and available preceptors to assist students on-site. All graduate programs except the HSR doctoral program meet national disciplinary accreditation, which mandates student-to-faculty ratio.

College of Liberal Arts and Sciences

Prepared by Charles Brody, Associate Dean
Approved by Nancy A. Gutierrez, Dean

Graduate Enrollment Projections, by Program

Program Name	Level	2019-2020 Goals	2024-2025 Goals
Africana Studies	Certificate	13	17
Anthropology	Master's	25	25
Art Administration	Certificate	0	0
Biology	Master's	23	26
Biology	Doctoral	25	31
Chemistry	Master's	23	27
Criminal Justice	Master's	32	34
Communication Studies	Master's	25	30
Emergency Mgt	Certificate	0	0
English Education	Master's	8	20
English	Master's	79	83
Applied Linguistics	Certificate	10	20
Earth Science	Master's	34	36
Ethics & Applied Philosophy	Master's	20	25
Applied Ethics	Certificate	5	7
Cognitive Science	Certificate	15	20
Geography	Master's	35	45
Geog & Urban Regional Analysis	Doctoral	33	35
Gerontology	Certificate	15	15
Gerontology	Master's	20	20
History	Master's	55	60
Health Psychology	Doctoral	46	48
Liberal Studies	Master's	50	70
Latin American Studies	Master's	22	27
Applied Mathematics	Doctoral	50	60
Mathematics Education	Master's	7	10
Mathematics	Master's	25	30
Public Administration	Master's	85	85
Public Budget & Fin	Certificate	10	20
Nanoscale Science	Doctoral	27	40
Nonprofit Management	Certificate	26	30
Optical Sci & Engineering	Master's	8	10
Optical Sci & Engineering	Doctoral	48	50
Organizational Science	Doctoral	25	25
Applied Physics	Master's	13	15
Public Policy	Doctoral	35	35
Clin & Community Psychology	Master's	21	30

Industrial & Org Psychology	Master's	15	15
Religious Studies	Master's	22	24
Sociology	Master's	22	25
Spanish	Master's	34	44
Tech/Prof Writing	Certificate	12	12
Translating/Translation	Certificate	16	23
Urban Mgmt & Policy	Certificate	10	20
Gender, Sexuality & Wm St	Certificate	20	40
Total		**1144**	**1364**

College-Level Resource Requests

Additional Information that Affects Enrollment Projections

1. If enrollments are to be limited, describe the restrictions and the reasons for them.

Programs indicated a variety of reasons for limiting enrollments but lack of resources – student support, tenure-line faculty and space – was the main reason cited. The science programs, in particular, noted too little and inadequate laboratory space. A few (MPA and Health Psychology) mentioned accreditation issues. Most of the PhD programs project very little growth especially in the short run; only 55 additional PhD students are projected in the 10-year target figure.

2. Indicate any new faculty positions/resources required to achieve the enrollment projections.

The additional SCH produced by the target enrollments for one, five and 10 years suggests the need for six, 23, and 40 additional faculty members at those time points. (The projected need from departments was actually somewhat higher than these figures.) The amounts for the low and high goals were adjusted accordingly.

3. Indicate any new student resources required to achieve the enrollment projections.

Funding for graduate students, and, in particular, increasingly competitive graduate assistantships, was the single greatest need expressed by the chairs and program directors. For several years, raising existing GA stipends to a more competitive level (minimum of $10,000 for Masters and $16,000 for PhD), has been a CLAS priority. Departments have indicated difficulty recruiting students with the current stipend levels. The low goal for one year includes the adjustment to raise the minimum stipends and includes 20 $1,000 scholarships for certificate programs and MA programs that do not have assistantships.

4. Indicate any new support (staff) resources required to achieve the enrollment projections.

Several of the programs that are projecting growth indicated the need for additional support staff, and some of the interdisciplinary programs that expect growth are currently sharing a single staff member. The additional enrollments for one, five and ten years require one, five and nine additional support staff.

5. Indicate any new physical (facility) resources required to achieve the enrollment projections.

Space is needed for growth in all programs except, perhaps, the certificate programs. Chairs and directors indicate the need for additional office space for new faculty and GAs. The science departments (especially Chemistry and Geography & Earth Sciences) cite the need for more and improved lab space. CLAS has no additional space available, and no new buildings are on the near-term horizon. No realistic estimate can be provided to provide the additional space for up to 500 new graduate students, 50 new

faculty and nine staff across our nearly 50 graduate programs.

6. Provide additional context as needed herein.

Since the recession of 2008-09, undergraduate major enrollments in CLAS have increased by nearly 30%, yet the number of full-time faculty has declined slightly. Moreover, the number of tenure-line faculty has been decreasing more rapidly, and more lecturers have been hired in their place. While lecturers contribute significantly to the undergraduate teaching mission, more tenure-line faculty are needed to expand the graduate and research missions of the College. Chairs and program directors stressed this need as well as the fact that it is less than ideal to attempt to project graduate enrollments without simultaneously considering the increasing undergraduate enrollment. Finally, these projections only consider existing graduate programs and not any new programs that might come online, such as professional master's programs or planned doctoral programs in the area of digital humanities.

The Graduate School

Prepared and Approved by Tom Reynolds, Dean

Graduate Enrollment Projections, by Program

		2019-2020 Goals			2024-2025 Goals		
Program	Level	Low	Target	High	Low	Target	High
Health Informatics	Master's PSM	80	100	110	100	110	125
Health Informatics	Certificate	27	33	36	33	36	41
DSBA	Master's PSM	80	110	100	110	125	150
DSBA	Certificate	27	36	33	36	41	50

College-Level Resource Requests

Additional Information That Affects Enrollment Projections

1. If enrollments are to be limited, describe the restrictions and the reasons for them.

For both the Health Informatics and DSBA programs, growth will be limited primarily by access to faculty. In theory, the program could expand class sizes or reach out to adjunct faculty to create additional sections of popular courses to expand capacity. The reality is that for both the College of Health and Human Services and the College of Business, there are limitations due to respective accreditation standards. For the MHA program, class size is particularly important, and for the MBA and Business programs, there is a requirement for full-time faculty to teach courses.

2. Indicate any new faculty positions/resources required to achieve the enrollment projections.

Related to comments above, full-time, tenured faculty are required for growth.

3. Indicate any new student resources required to achieve the enrollment projections.

Assistantships and aid will facilitate recruitment of quality candidates.

4. Indicate any new support (staff) resources required to achieve the enrollment projections.

We have proposed a new combined Student Services Coordinator for the DSBA and HI programs to support day-to-day administrative needs and an Administrative Assistant to support the DSBA Program Director, the Graduate Center Director, and the larger DSBA Academic initiative. In addition, the PSMs requirement for professional skills/PLUS course, combined with the large enrollment and the cross-curricular nature of the programs, argues for a full-time Curriculum Specialist. That position would not only develop and deliver PLUS courses, but would also develop and coordinate interdisciplinary curriculum within the program and between departments.

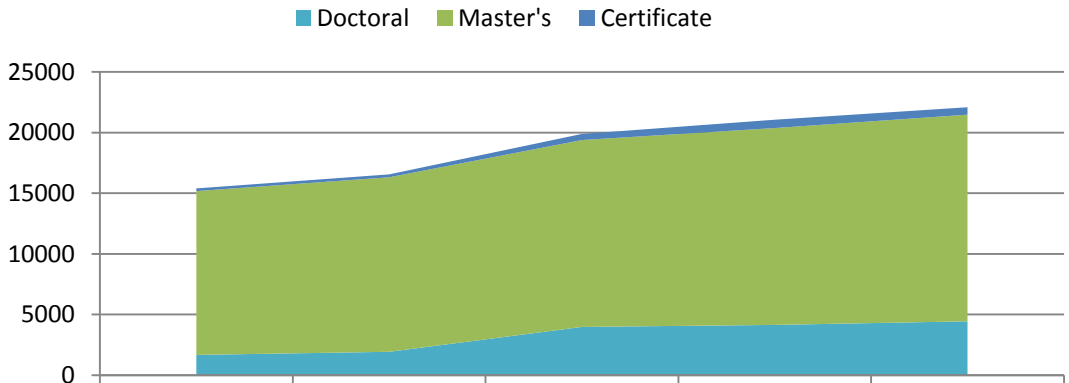
5. Indicate any new physical (facility) resources required to achieve the enrollment projections.

A key obstacle for the interdisciplinary programs is a central location, a hub where faculty, students, and industry partners can work and collaborate. We will need a central administrative space, with faculty offices, study and collaboration space. In addition, an interdisciplinary lab space will be required that gives all stakeholders access to cutting-edge technology and software for research.

Program Prioritization by Graduate Level

According to the National Center of Education Statistics' (NCES) Integrated Postsecondary Education Data System (IPEDS), degree conferrals in North Carolina for doctoral programs have grown by 28% since 2008, while master's degree conferrals have grown by 6%. While certificate conferrals have grown by 29% in the same time period, examining certificate conferrals through IPEDS is less reliable than other degree levels;[63] therefore, more research would need to be conducted to accurately evaluate the certificate market.

Degree Conferral Headcount Growth in North Carolina between 2008 and 2012, by Degree Level



	2008	2009	2010	2011	2012
Certificate	218	237	503	686	613
Master's	13508	14392	15410	16234	17037
Doctoral	1674	1928	3980	4146	4445

[63] While all information in IPEDS is self-reported by institutions and required for those receiving title IV funding, institutions are not required to report data on certificates. Further, many of these programs are non-credit or completed in addition to a master's degree; therefore, it is less likely that institutions accurately report information on these programs to IPEDS. In order to assess the market for certificate programs, primary research methodologies are advised.

Dashboard Scorecard

Name of Metric	Metric Definition	Rating 1	2	3
Supply to Demand	Comparison of five-year CAGR of degree conferrals to five-year CAGR of number of providers	Supply > Demand	Supply = Demand	Supply < Demand
Competition	Number of providers reporting conferrals	Lowest quartile of providers	Middle quartiles of providers	Highest quartile of providers
Market Size	Overall size of the market (e.g., number of conferrals reported in 2012)	Lowest quartile of market size	Middle quartiles of market size	Highest quartile of market size
Labor Demand	Number of jobs projected in 2022	Lowest quartile of projected jobs	Middle quartiles of projected jobs	Highest quartile of projected jobs

Name of Metric	Metric Definition	Rating 1	0
Fit in Portfolio	Whether UNC Charlotte reported degrees to the CIP code in 2012	UNC Charlotte does offer the program	UNC Charlotte does not offer the program

About Eduventures

Eduventures is the industry leader in research, data, consulting, and advisory services for the higher education community. For 20 years, college and university leaders and education industry providers have looked to Eduventures for innovative and forward-looking ideas, for insights into best practices, and for help with making the strategic and operational decisions vital to their success. More about Eduventures can be found at www.eduventures.com.

D. SoA 2015-2020 Strategic Plan

EXECUTIVE SUMMARY

A.1. Mission of the School of Architecture (2015-2020 plan)

The Mission of the School of Architecture is to advance excellence in architectural education through innovative research, teaching and design practices.

A.1.1 Vision

In five years, the School of Architecture at UNC Charlotte will be known for its Culture of Innovative **Research** and **Design Practices**.

> Alignment to College of Arts + Architecture Goals

The School of Architecture's Dual Strategic Planning goals to **Advance Excellence in the Built Environment through (1) Research and Interdisciplinary Collaboration** and **(2) Innovative Design Practices** each directly contribute to the College of Arts + Architecture goals as indicated in the following highlighted phrases from 2015-2020 College Strategic Plan.

1. **Present degree programs that align with emerging methods of practice in all arts and design disciplines at both undergraduate and graduate levels**.

The School of Architecture supports this College goal through the following objectives and action items:

- **Objective 1.2:** Increase Pre-Professional and Post-Professional Degree Offerings within the School.
  - **Action 1.2.1:** Establish a Master of Science in Architecture with multiple areas of interdisciplinary concentration: Design and Computation (SoA/CS), Building Performance (SoA/CoE), Urban Analytics (SoA/GEOG/CS), Architectural History, and Historic Preservation (SoA/AAH).
  - **Action 1.2.2**: Strengthen the interdisciplinary of our existing pre-professional undergraduate degree through increased integration with the arts and the addition of optional minors in Architectural History/Theory/Criticism and Environmental Design.

2. Emphasize and demonstrate how diversity is central to our skill and cultural development.

The School of Architecture supports this College goal through the following action item:

Action 1.4.1: Expand and focus recruitment to increase the diversity of the student body.

3. Promote public programming and scholarship on arts and design in the public interest.

The School of Architecture supports this College goal through the following action item:

- **Action 2.1.7**: Create a vibrant culture of public events in Center City to raise the visibility of the School.

4. Develop an innovative and supportive operational culture and systems to support the mission of the college.

The School of Architecture supports this College goal through the following objectives:

- **Objective 1.1:** Promote research and interdisciplinary collaboration within the College and across the University.

> Alignment with the College of Arts + Architecture Survey

The School of Architecture's Dual Strategic Planning goals to **Advance Excellence in the Built Environment through (1) Research and Interdisciplinary Collaboration** and **(2) Innovative Design Practices** each directly contribute to the College of Arts + Architecture survey as indicated in the following results:

- 65.69% of Survey respondents rated Interdisciplinary coursework within a major as "very important;" 45.37% of Survey respondents rated Interdisciplinary Arts and Design Thinking as "very important" while 29.47% of respondents chose "important."
- 51.06% of Survey respondents rated Art and Design in the Public Interest as "important" while 26.60% of respondents chose "very important."
- 35.24% of Survey respondents rated Global Education and Practices as "very important" while 49.52% of respondents chose "important;" 80% of Survey respondents rated the significance Cultural Perspective gained through International Education as "very important."
- 38.10% of Survey respondents rated Sustainability as "very important" while 38.10% of respondents chose "important."

> Alignment with the School of Architecture Survey Questions within the College of Arts + Architecture Survey:

The School of Architecture's Dual Strategic Planning goals to **Advance Excellence in the Built Environment through (1) Research and Interdisciplinary Collaboration** and **(2) Innovative Design Practices** are framed in relation to the School of Architecture section within the College of Arts + Architecture survey as indicated in the following results:

- 54.55% of Survey respondents rated SoA participation in CoAA Interdisciplinary degree programs, certificates, or other instruments of collaboration as "important" while 9.09% of respondents chose "very important."
- 54.55% of Survey respondents rated curricular overlap and shared coursework between the SoA and other CoAA units at the undergraduate level as "important" while 18.18% of respondents chose "very important."
- 45.45% of Survey respondents rated engagement with other CoAA disciplines as "very important" while 27.27% of respondents chose "important;" 63.64% of Survey

respondents rated engagement with other CoAA disciplines as "very important" in setting the SoA apart from other educational choices.

- 63.64% of Survey respondents rated an expanded CoAA footprint in the Center City Campus as "very important."

B. Process for Strategic Plan

The School of Architecture began evaluating its strategic goals in Fall 2014 with a faculty-wide survey in which 18 faculty members participated prior to the start of the fall term. Themes arising from this survey were discussed at the first faculty meeting of the term and a Strategic Planning Working Group was elected at that time. This was followed in the fall term by a series of 6 open meetings (9.3.14, 9.24.14, 11.5.14, 11.19.14, 1.12.15, 2.11.15) with faculty facilitated by the Strategic Planning Working Group. 2 two additional open meetings (10.27.14, 2.20.15) were scheduled in order to address faculty concerns and strategic planning updates and focused discussions were held in 4 faculty meetings (10.15.14, 11.12.14, 1.5.15, 2.1.15). These meetings focused upon the 2010-2015 Strategic Plan, various drafts of strategic planning documents based on themes and goals derived from the fall 2014 survey, and discussions of emerging new themes and goals to be included in a 2015-2020 Strategic Planning document.

This process was complimented by sequential solicitations for feedback based upon initial drafts of the Strategic Plan; feedback was solicited via email prior to each open meeting with the strategic planning working group. Over the course of the fall and spring term, 16 faculty members provided written or electronic feedback on various drafts of the strategic plan.

It should be noted that a number of faculty participated in the open strategic planning working group meetings and on-going discussion (via email) held in January and February of 2015. This resulted in an extended roster for the Strategic Planning Working Group; our initial composition of 5 members (Gamez-Chair, Makas, Brentrup, Gentry, Snyder, and Swisher) was extended to include an additional 11 (Forget, Beorkrem, Sauda, Wong, Senske, West, Carlson-Reddig, Ellinger, Kwiatkowski, Balmer, Davis), which brought the informal total to 16 participants. This "extended" working group contributed to the development of the February "working drafts" of the strategic plan, which led to the final document dated February 27, 2015. A series of 3 formal "draft" documents (including the final draft) were developed by the committee and submitted to the Director of the School of Architecture in accordance to timelines established by the College of Arts and Architecture (10.24.14, 1.30.15, 2.27.15).

STRATEGIC GOALS, OBJECTIVES, ACTION PLANS, AND PERFORMANCE OUTCOMES FOR 2015-2020

Goal 1: Advance Excellence in the Built Environment through Research and Interdisciplinary Collaboration

- **Objective 1.1:** Promote research and interdisciplinary collaboration within the College and across the University.
  - **Action 1.1.1:** Revise the School's RPT policy to recognize interdisciplinary scholarship as a category of creative work that counts toward tenure and promotion.
  - **Action 1.1.2:** Expand opportunities for students to work collaboratively with faculty through colloquia, conference presentations and multidisciplinary hubs of scholarship.
  - **Action 1.1.3**: Partner with other units in the College to create a project grant and course release policy that supports interdisciplinary 1) coursework, 2) projects/events, and/or 3) research that lead to scholarly outcomes (publications, peer-reviewed activities and performances, competitions, etc.).

- **Objective 1.2:** Increase Pre-Professional and Post-Professional Degree Offerings within the School.
  - **Action 1.2.1:** Establish a Master of Science in Architecture with multiple areas of interdisciplinary concentration: Design and Computation (SoA/CS), Building Performance (SoA/CoE), Urban Analytics (SoA/GEOG/CS), Architectural History, and Historic Preservation (SoA/AAH).
  - **Action 1.2.2**: Strengthen the interdisciplinary of our existing pre-professional undergraduate degree through increased integration with the arts and the addition of optional minors in Architectural History/Theory/Criticism and Environmental Design.
  - **Action 1.2.3**: Create post-graduate student offices to support student research.

- **Objective 1.3:** Increase Support for Research Initiatives.
  - **Action 1.3.1:** Establish a School of Architecture Research Office and Staff position.
  - **Action 1.3.2**: Create distinct research/practice, teaching, and joint faculty appointments with clearly articulated rationale, course-load, and productivity expectations.
  - **Action 1.3.3:** Revise work-load policies associated with large lecture format classes and design studio courses.
  - **Action 1.3.4:** Integrate faculty research into School curricula and coursework including international programs.
  - **Action 1.3.5:** Increase funding for additional graduate research and teaching assistantships.
  - **Action 1.3.6**: Increase funding for the School's Teaching Research Fellowship and expand responsibilities to include independent coursework for fellows to build their teaching portfolios.
  - **Action 1.3.7**: Establish Research Fellowships and create independent coursework for fellows to build their teaching portfolios.

- **Objective 1.4:** Increase the Diversity of the School's Student Population.
  - **Action 1.4.1:** Expand and focus recruitment to increase the diversity of the student body.
  - **Action 1.4.2:** Conduct a climate study in order to assess the degree to which the School is welcoming to diverse student groups; develop additional action items in response to the climate study findings**.**
  - **Action 1.4.3**: Expand scholarships for high school students to attend the School's summer camp and to identify potential recruits for the undergraduate program.
  - **Action 1.4.4**: Establish a School Recruitment and Outreach staff position.

Goal 2: Advance Excellence in the Built Environment through Innovative Design Practices

- **Objective 2.1:** Integrate Teaching with Innovative Practices
  - **Action 2.1.1:** Seek funding for an endowed Distinguished Professor (long term--5 year appointment) intended have a "high impact" upon the School through research, publications, symposia, and workshops.
  - **Action 2.1.2**: Establish a Visiting Professor of Practice program in which external critics are invited to participate actively in the School for short term (1 to 2 semesters) through multiple visits, master classes, and/or co-teaching studios.
  - **Action 2.1.3:** Renovate/modernize classrooms and seminar rooms to better integrate technology.
  - **Action 2.1.4:** Create "clean + dirty" and/or "war room" spaces within existing studios to support collaborative and research activities; integrate technology (wireless systems, monitors, writing surfaces, pin-up areas) to support on-going collaborative activities.
  - **Action 2.1.5**: Increase computational and environmental literacy of faculty through School sponsored workshops, retreats, and tutorials.
  - **Action 2.1.6**: Partner with the AIA to develop a network of professional guest reviewers to participate in School presentations/reviews/juries.
  - **Action 2.1.7**: Increase funding/resources to support guest reviewers from out of state to participate in School presentations/reviews/juries.
  - **Action 2.1.8**: Create a vibrant culture of public events in Center City to raise the visibility of the School.

- **Objective 2.2:** Increase relationships with professional partners outside the University that foster innovative design practice models and that prepare students to become design leaders.
  - **Action 2.2.1:** Partner with the AIA to create a network of internship opportunities.
  - **Action 2.2.2:** Create release time opportunities that support faculty collaborations with practice sponsored positions/and or projects.
  - **Action 2.2.3:** Increase professional and institutional relationships that foreground innovative practice-based environments, create partnerships, and foster unique studio environments.
  - **Action 2.2.4**: Increase the number of practicing architects teaching in advanced studios.
  - **Action 2.2.5**: Establish a "Faculty Practice Grant" (modeled upon the current SoA FRG) to foster design practices among School faculty.
  - **Action 2.2.6**: Create an "incubator practice space" to support design practices among School faculty.

- **Objective 2.3:** Clarify the goals of and relationships between pre-professional, professional and post-professional (research) degree paths.
  - **Action 2.3.1**: Reassess the format and viability of the School's professional degree programs in the context of changes in licensure requirements promoted by the National Council of Architectural Registration Boards. Add, transform, or eliminate professional paths as indicated by the assessment. Degree formats to be assessed include current B Arch and M Arch options, 5-year integrated program (as B Arch or M Arch), and 3+2 leading to M Arch Degree.
  - **Action 2.3.2**: Determine the viability of graduate programs organized by degree tracks and interdisciplinary research opportunities and make any necessary changes.
  - **Action 2.3.3**: Base selected portions of the School's curriculum and initiatives within the Center City.

- **Objective 2.4:** Establish international study and global literacy as fundamental to the culture of our School.
  - **Action 2.4.1:** Establish a regular, rotating semester abroad program offering a full credit hour course load curriculum (including studio).
  - **Action 2.4.2:** Establish an endowment for scholarships intended to offset the costs of international study programs/tuition.
  - **Action 2.4.3:** Increase participation in studying abroad by improving communication with students about opportunities and financing study abroad with ongoing curricular advising, augmented website, and regular information sessions; clarify degree costs that include required study abroad experiences.

Resources Required

To implement these goals the School will need the following resources:

Personnel:

Endowed Distinguished Professor faculty position

- Distinguished Professor of Practice appointment with flexible funding for travel, guest reviewers and studio-based publications (**See Action 2.1.1**).

Endowed Visiting Professor of Practice

- Endowed "Visiting Professor of Practice" program with flexible funding and teaching arrangements (**See Action 2.1.2**).

New Faculty lines to support pre-professional, professional, and post-professional degree programs

- Tenure track (**See Action 1.2.1 and Action 1.2.2**):
  --Assistant Professor in Representation / Foundational Design
  --Assistant Professor in Materials / Structural Integration
  --Assistant Professor in Architectural History
- Non-tenure track faculty lines to support professional and post-professional degree programs (See **Action 2.2.2** and **Action 2.2.4**):
  --2 part-time Adjunct Professors of Practice to offer courses in graduate and undergraduate curricula.
  --2 full-time Lecturer positions in the core to support refocusing of full-time tenured and tenure-track faculty towards specialized teaching in post-professional programs.

- Research Fellow ($30,000) to support the School's research centers (**See Action 1.3.7**).
- Increased funding for the School's existing Teaching Fellowship program (**See Action 1.3.6**).
- Additional graduate research and teaching assistantships (**See Action 1.3.4**).
- New staff for Center City to oversee increased curricular activity, programming, day to day advising (**See Actions 2.2.2, 2.2.3, 2.3.3, and 2.3.4**).
- New Recruitment, Internship and Out-reach Coordinator Staff position (**See Action 1.4.1 and Action 2.2.1**).
- New School of Architecture Research Staff position (**See Action 1.3.1**).

Programs to Support Interdisciplinary Initiatives:

- Partner with other units in the College to establish an "Interdisciplinary Project Grant" (modeled upon the current SoA FRG) to foster collaboration among School and College faculty (**See Action 1.1.3**).
- Establish a "Faculty Practice Grant" (modeled upon the current SoA FRG) to foster design practices among School faculty (**See Action 2.2.5**).

Space:

- Renovate Storrs, particularly studio areas, and add furniture as necessary to facilitate collaborative work environments (**See Action 2.1.3**).
- Relocate CoAA staff offices to free up room in Storrs to create designated teaching / research fellows and post-professional student research offices and/or spaces for advanced research students to work and study in Storrs **(See Actions 1.2.3, 1.3.5, 1.3.6, and 1.3.7).**

- Integrate technologies (TBA) and furnishing to facilitate collaborative learning (**See Action 2.1.2**).
- Space for a School Recruitment, Advising and Outreach Office (**See Action 1.4.5**).
- "Incubator" spaces to support design practices among School faculty including expanded and/or additional "warehouse" fabrication space (**See Action 2.2.6**).
- Space for School of Architecture Research Office (**See 1.3.1**)

Technology:

- Wireless monitors with "writable surfaces" (**See Action 2.1.2**).
- Wireless monitor systems, "smart-board" systems with integrated projection and writing surfaces (**See Action 2.1.2**).
- Funding to support faculty/expert facilitators, tutorial/workshop/retreats to be offered to/by faculty on a regular basis (**See Action 2.1.4**).

Honoraria:

- Increase funding and resources to support guest reviewers from out of state to participate in School presentations/reviews/juries (**See Action 2.1.6).**

Scholarships:

- Endowment to support student international experiences / requirements (**See Action 2.4.3**).

Diversity:

- Partner with the Institute for Social Capital or outside consultant to conduct a climate study for the School of Architecture (**See Action 1.4.2**).

E. Sample Job Postings

Non Tenure Track Academic Professional Faculty Position in Art and Interior Architecture: Digital Director

THE UNIVERSITY of NORTH CAROLINA
GREENSBORO

Date: No date provided URL: https://jobsearch.uncg.edu/

CONTENT

Non Tenure Track Academic Professional Faculty Position in Art and Interior Architecture: Digital Director

College of Arts & Sciences
University of North Carolina at Greensboro
17 September 2014

Description

We are seeking a non-tenure track Academic Professional faculty member who will serve as the Digital Director in the Gatewood Studio Arts Building and manage the digital activities in the departments of Art and Interior Architecture (IARc). As a 12-month faculty appointment, the Digital Director is expected to work with a faculty

advisory group to provide support for the departments' educational programs which includes management, coordination, and upkeep of the digital facilities as well as advice and guidance regarding technological changes and advances. Digital facilities include new media design studios and classrooms, the digital photography lab, the art education classroom, IARc Library, conference rooms, rendering farm, and computer-aided making machines. This is a one year appointment with the possibility of renewal.

Duties and Responsibilities

The Digital Director will:

- manage digital facilities including departmental servers, wired and wireless networking, software, hardware, and supplies
- maintain scheduled hours in the digital studios and classrooms to assist students and faculty with application of software and digital techniques and technologies as they relate to classroom instruction
- supervise undergraduate and graduate student assistants
- provide curricular support to faculty and students which may include workshops or assisting faculty in their courses when a particular computing expertise is required, e.g., demonstrating website development to a class
- maintain a working relationship with UNCG IT Services
- continue education and remain current regarding innovations in hardware and software

Supervision

The Digital Director position will be supervised by the Chair of the Art Department in consultation with the Chair of Interior Architecture. An advisory committee consisting of faculty from the departments of Art and Interior Architecture will meet regularly with the Digital Director to address day to day management of the labs and studios and to discuss future developments.

Minimum Qualifications

- Master's degree or equivalent experience in a relevant field such as design or computing
- expertise with MacOS and Windows operating systems and software such as Adobe Creative Suite, Final Cut Pro, Audacity or other sound editing software, 3D imaging software such as Rhino, Revit, and AutoCAD, and a willingness to receive training in existing and new software
- experience with html, c++, css, php, mysql and other web-related software and tools including department servers
- ability to install, maintain, and troubleshoot hardware and software
- experience with educational programs or settings
- ability to work independently without detailed supervision

Compensation

Compensation will be competitive and commensurate with the candidate's experience.

Review of applications begins 31 October 2014. The start date is 02 January 2015. To apply for this position, go to the UNCG JobSearch website: https://jobsearch.uncg.edu/ and click on Faculty Not on Track.

EOE AA/M/F/D/V

TAGS

job

ABOUT ACADIA

The **Association for Computer Aided Design in Architecture** is an international network of digital design researchers and professionals. We facilitate critical investigations into the role of computation in architecture, planning, and building science, encouraging innovation in design creativity, sustainability, and education.

Learn more

2016 ACADIA CONFERENCE

POSTHUMAN FRONTIERS: DATA, DESIGNERS AND COGNITIVE MACHINES fosters design work and research from the worlds of practice and academia that lie at the intersection between procedural design, designed environments and autonomous machines. It explores recent work within computational design that develops and applies the integration of software, information, fabrication, material intelligence and sensing to generate mechanisms for interfacing with the physical realm.

Important Dates:

- **January 13, 2016:** Call for Papers and Projects Announced
- **May 6, 2016:** Peer Review Papers Due
- **May 17, 2015:** Jury Selection Projects Due
- **June 27, 2016:** Revised Submissions Due (for proceedings)
- **October 24-26, 2016:** ACADIA 2016 Workshops
- **October 27-29, 2016:** ACADIA 2016 Conference

- **October 30, 2016:** Tours of Detroit (optional)

GENERAL CONFERENCE INFO
e: 2016@acadia.org
w: 2016 ACADIA Conference

Job Openings

Instructor, Computer Aided Drafting and Design - 1 Year Temporary

Marie Curie Trainee (Early Stage Researcher) at UCL

Tenure Track Position(s) at Laurentian University

Lecturer / Senior Lecturer, Auburn University

Position at the University of Virginia

ASSISTANT PROFESSOR, BALL STATE UNIVERSITY

Positions at Cal Poly, San Luis Obispo

Assistant Professor, Rhode Island School of Design

Washington University in St. Louis Associate or Full Professor

Kent State University Tenure-Track Position in Interior Design

Digital Director, University of North Carolina at Greensboro

Tenure Track Position(s), Laurentian University

SIAT - SFU – Lecturer - Various

Digital Practice Office Leader - (142727)

Description

About Us
At HDR, we specialize in engineering, architecture, environmental and construction services. While we are most well-known for adding beauty and structure to communities through high-performance buildings and smart infrastructure, we provide much more than that. We create an unshakable foundation for progress because our multidisciplinary teams also include scientists, economists, builders, analysts and artists. That's why we believe diversity is our greatest strength. HDR is proud to be an equal opportunity workplace and an affirmative action employer.

Watch our **'About Us'** (https://www.youtube.com/watch?v=bWZw3sXVyNU) video

We believe that the way we work can add meaning and value to the world. That ideas inspire positive change. That coloring outside the lines can illuminate fresh perspectives. And that small details yield important realizations. Above all, we believe that collaboration is the best way forward.

Job Description
The ideal candidate will work directly with designers, architects, engineers and consultants to leverage design technology as an integral project design and delivery process. Daily involvement within the practice will include working closely with leaders, multi-disciplinary teams, and the broader Digital Practice network across the company. The candidate will be responsible for engaging both the local digital practice as well as national digital design leadership to maintain awareness and encourage advanced and consistent use of design technology in daily practice. The successful candidate will embody a design focused understanding of digital tools and process. They will have the ability and desire to foster learning and adoption across the practice with the motivation to learn new tools, and have demonstrated outstanding communication and teamwork skills. Fundamental to this position will be a working knowledge of the Architectural design process and uses of design technology in different stages.

Primary Responsibilities

- Serve as the primary point of contact for the office in understanding design technology including project information management, BIM, computational design, visualization and related delivery resources.
- Serve as the office's liaison to the firm-wide Digital Practice group and other office's digital leaders to ensure that best practices are effectively leveraged through the organization
- Lead efforts relating to Building Information Modeling (BIM) and overall vision and initiatives that will streamline use of BIM at HDR
- Guide local project teams in ensuring that BIM guidelines and best practices are properly met
- Lead technology training as required to ensure that all staff members have the appropriate level of knowledge required to successfully execute their work

Qualifications

Required Qualifications

- Bachelor's degree in Architecture
- 5+ years AEC industry experience
- Revit Architecture, AutoCAD and Navisworks experience
- Strong leadership, communication and relationship management
- Desire to teach others about design technologies in daily practice
- Aptitude toward technology and analytical problem-solving skills
- Ability to challenge status quo in a constructive and successful fashion and mentor staff
- Demonstrated leadership skills
- Strong interpersonal communication and demonstrated oral and written presentation skills
- Experience managing large complex workflow performance as a BIM Manager on Healthcare, Science+Technology and/or Civic projects with a $100M+ budget
- Demonstrated experience in execution of owner-driven BIM guidelines, as well as creation and deployment of Project Execution Plans (PxP)
- Experience and interest in sustainable design and LEED process
- An attitude and commitment to being an active participant of our employee-owned culture is a must

Why HDR
At HDR, we know work isn't only about who you work for; it's also about what you do and how you do it. Led by the strength of our values and a culture shaped by employee ownership, we network with each other, build on each other's contributions, and collaborate together to make great things possible. When you join HDR, we give you license to do the same. We help you take charge of your career, giving you multiple growth opportunities along the way.

*LI-TT1

Primary Location United States-Virginia-Arlington
Industry Architecture
Schedule Full-time
Employee Status Regular
BusinessClass: General Architecture
Posting Date Aug 12, 2016

Computational Designer

Employer: Ennead Architects
Location: New York, NY, US
Posted on: Tue, Jul 19 '16

Ennead Architects is a multidisciplinary design firm with projects ranging from museums and performing arts centers to complex laboratory, research and teaching facilities for higher education, from large scale infrastructure projects and urban plans to hotels and residential buildings. To address the challenges and opportunities that accompany digital practices Ennead maintains an Applied Computing Department that advances and makes computational methods available to all staff.

The Applied Computing Department maintains three central goals: to advance process and workflow such that project tasks are being executed in the most efficient and precise way, to maintain an ever evolving curriculum of coursework and training that ensures our staff not only has a strong command of their tools but a common conceptual understanding of their practice, and to develop standards that ensure consistency on all projects across the studio, establishing a homogeneity to our work product.

We are looking for a highly talented, motivated and idio-didactic individual to assist in advancing the process based arm of Applied Computing. The candidate would work alongside project teams on a daily basis to conceptualize and implement advanced workflows during the schematic and design development phases of a project. Current areas of interest include computational geometry, performance/environmental analysis and virtual reality. The candidate should be proficient in Grasshopper and advanced modeling techniques, be comfortable with the Python programming language and be able to quickly learn and adapt new technologies into valuable workflows for project teams. Years of professional experience, 0-2.

Responsibilities:

- Research and Development
- Establish documented design processes
- Digital asset creation and management
- Interoperability of design and documentation tools
- Proactive approach to learning new software technology
- Create Rhino/Grasshopper design standards
- Project Support – modeling, scripting

Skills:

- Advanced proficiency in Grasshopper
- Advanced modeling proficiency in Rhino
- Working knowledge of Python and/or C#
- Application development a plus

The firm is an equal opportunity employer and complies with applicable local, state and federal fair employment practices laws. The firm gives equal opportunity and consideration to employees and applicants without regard to race, color, religion, national origin, citizenship status, creed, age, disability which is unrelated to the individual's ability to perform the duties of a particular job or position, sex, marital status, sexual orientation, gender identity, veteran status, or any other characteristic protected under applicable local, state or federal laws.

If you are interested in this position, please email your resume, cover letter and portfolio, as well as submit the Applicant ID, Veteran Self-ID, and Disability Self-ID Forms which can be found on our website, http://www.ennead.com/employment. All materials should either be mailed and addressed to Human Resources, or emailed to employment@ennead.com. In addition, please reference job #111 when applying.

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[redacted]

Director of Design Technology

PEI COBB FREED

Employer: Pei Cobb Freed & Partners
Location: New York, NY, US
Posted on: Wed, Jul 6 '16

Responsible for leading the firm's strategy, management, and innovative use of digital technology—integrating information and knowledge management approaches, design and project management applications, BIM/CAD implementation, and advanced modeling and visualization techniques—with an emphasis on positioning the firm at the forefront of design technology, enhancing capabilities, optimizing workflow/productivity, and ensuring quality of our work product.

- monitor and maintain firm's standard project workflows as they pertain to applications and hardware
- consult with project teams to ensure optimization of standard workflows and train team members as needed; work with project teams to customize workflows as required for individual project circumstances
- work with project teams to develop solutions to modeling, geometry, automation, and interoperability challenges
- lead ongoing initiative to evaluate and integrate energy analysis applications, data visualization methodologies, and interactive presentation/design techniques
- research, evaluate, and recommend software, applications, hardware, devices and network solutions
- maintain, update, and disseminate Revit/BIM library, templates, standards, working methodologies, QA/QC procedures
- maintain systems and platforms for knowledge/information capture and dissemination within studio
- participate in industry events
- shared responsibility with Director of IT to select hardware and software
- shared responsibility with Director of Communications & Information Management to track, gather, and organize project data and statistics for use within studio and for future reference
- shared responsibility with Director of Information Technology and Director of Communications & Information Management to ensure quality and value of printing, 3D printing, and output services

Qualifications:

- Minimum of a bachelor's degree in architecture, design, or engineering
- 4+ years of experience in architectural or engineering firm
- Expert proficiency in Revit, Rhino, adaptive components, Revit/Rhino interoperability, energy modeling applications, platform interoperability, and software/hardware specification in a professional firm
- Strong knowledge of architectural design process, documentation, drawing sets, and deliverables

Please submit a portfolio of work samples and resume in a single PDF not exceeding 5MB to careers@pcf-p.com with Archinect - Design Technology in the subject line.

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Suprastudio Assistant / Lecturer

Employer: University of California, Los Angeles (UCLA)
Location: Los Angeles, CA, US
Posted on: Wed, Jun 1 '16

RECRUITMENT PERIOD

Open May 16th, 2016 through June 13, 2016

DESCRIPTION

SUPRASTUDIO ASSISTANT / LECTURER
https://recruit.apo.ucla.edu/apply/JPF02234

UCLA Architecture and Urban Design seeks a lecturer to support lead instructor Guvenc Ozel for the 2016/2017 OZEL-SUPRASTUDIO at the IDEAS campus.
SUPRASTUDIO is a research platform in architecture education that advances experimentation and cross-disciplinary collaboration among professors, students, and industry collaborators to expand the boundaries of architectural practice. The program is a one-year post-professional course of study that leads to a Masters of Architecture degree. Throughout the year, students work on a dedicated research topic to build a continuous and in depth line of study.
SUPRASTUDIO fills a current void in architecture education by providing a dedicated program and satellite campus for advanced applied research for the future of architecture and urban design.

OZEL SUPRASTUDIO

Scenarios on the 4th Industrial Revolution:
AI, Heightened Mobility and Cyber-physical Systems

Popularly labeled as the 4th Industrial Revolution, proliferation of additive manufacturing, robotics, sensors, virtual reality and artificial intelligence is starting to change the socioeconomic structure of our society and consequently revolutionizing the way we design and experience spaces. Coupled with climate change, political tensions and ever-increasing mobility, autonomous cyber-physical systems are starting to make the spaces we occupy more intelligent, transient and agile.

On Earth, intelligent transport systems are changing the way we envision and inhabit spaces as the nature, speed and range of transport change. Although the speed of transport is increased and made more efficient, the amount of time spent during transport is increasing as the distinctions between work and leisure spaces blur. The notions of architecture and transportation are starting to merge as autonomous vehicles are exceedingly being considered as extensions of architectural spaces; enhanced with interactive technologies and media interfaces. These new media interfaces in the form of virtual and augmented reality are used to construct larger interactive digital worlds in confined physical spaces. As a consequence, the autonomous transportation vehicle becomes an architecture in motion in the digital and the physical worlds.

In the opposite end of the spectrum of heightened mobility, the advancements of the so-called 4th Industrial Revolution are also triggering a renewed interest in space travel, space tourism and eventual colonization of extraterrestrial contexts. Not since the Cold War, has space exploration captured the imagination of humankind as vividly as it does now. As private companies compete with government agencies to lead the efforts into increased human presence in outer space, both in volume and duration, it is ever more important for architects to be engaged with the design of environments suitable for human mobility and habitation in orbital and extraterrestrial contexts.

These technological paradigm shifts promise a heightened sense of interaction between humans and the spaces they occupy. In these scenarios, virtual worlds are no longer limited to be interfaces that enhance the physical environments but are exceedingly becoming spaces in their own right; blurring the distinction between the physical and the digital in our constructed reality.

As a continuation of his architectural research in artificial intelligence, generative design, technologically enhanced spaces and interactive environments supported by Autodesk, as well as his recent collaboration with the UCLA Department of Engineering in creating building scale 3D printing technologies for use on Earth and colonization of Mars, Ozel will use SUPRASTUDIO as a platform to exploit the potential for robotic fabrication, additive

manufacturing, interactive environments and virtual reality for designing environments suitable for extended human presence in new modes of mobility on Earth and extraterrestrial contexts. The studio will imagine scenarios for intelligent architectures that can move, self- generate, adapt, interact and autonomously fabricate through employing novel technologies, media interfaces and high performance materials.

For more information please visit:
http://www.aud.ucla.edu/programs/m_arch_ii_degree_1.html
(link might have to be updated to be specific to my studio)

RESPONSIBILITIES

UCLA is seeking to fill a one-year lecturer appointment to help coordinate this curriculum under the supervision and leadership of lead instructor Guvenc Ozel. The Lecturer's primary responsibility is to assist and support the lead instructor in his day-to-day tasks and functions. The lecturer is expected to be a team player with excellent report, communication and organizational skills. The lecturer position is a full-time commitment and requires preparation and management work in addition to the active teaching time during class. The lecturer reports to the Chair of the Department of Architecture & Urban Design. The responsibilities include:

• Under the leadership of the SUPRASTUDIO lead Faculty, co-teach SUPRASTUDIO;

• Under the supervision and approval of SUPRASTUDIO lead Faculty, teach two technology seminar courses directly related to SUPRASTUDIO topic;

• Under the leadership of SUMMER STUDIO lead Faculty, co-teach the SUMMER studio and technology lecture;

• Under the leadership and direct supervision of SUPRASTUDIO lead instructor, the candidate is responsible for the planning, coordination and execution of the studio activities including:

- Overall studio management,
- Coordination with UCLA A.UD Administration,
- Student management and assignments,
- Organization and logistics of field trips, workshops, seminars,
- Organization of exhibitions and publications for studio work
- Collect student work and maintain online studio work archive
- Actively manage and promote studio work through online presence and maintain the studio blog,
- Assist in future student recruitment and admission

• Help develop the studio curriculum and instructional plan;

• Prepare and deliver lectures & tutorials on topics determined by the lead instructor;

• Mentor, evaluate and monitor students' academic progress and research projects;

The ideal candidate will be future oriented, and have experience in a broad range of design disciplines, such as digital design tools, physical computing, digital fabrication, interactivity and sensors, media technology, augmented/ virtual reality and beyond.

We anticipate this appointment to be a one-year lecturer position for the period July 2016 to June 2017.

Minimum requirements include:
• Advanced degree (M. Arch or equivalent) in architecture and/ or media arts,
• Prior experience in teaching design,
• Knowledge of Virtual and Augmented Reality platforms,
• Knowledge in design related physical computing and sensor based prototyping,
• Knowledge in digital fabrication,
• Expertise in digital modeling, computational design and animation software.

Additional traits and experience desired includes the following:
• Knowledge and interest in Artificial Intelligence and autonomous systems
• Knowledge in robotics and electromechanical systems,
• Design and fabrication of full-scale development prototypes.
• Overall willingness and enthusiasm to learn new tools and software

How to apply:

Candidates are asked to submit a letter of intent with a curriculum vitae, examples of work as a PDF with additional links to relevant videos and web content, and the names, phone numbers, mail and email addresses of three references who are able to provide a knowledgeable evaluation of the applicant's qualifications. Examples of work should be submitted digitally at the following link:

recruit.apo.ucla.edu/apply
UCLA Architecture & Urban Design
Attn: OZEL LECTURER Search Committee
1317 Perloff Hall
Los Angeles, CA 90095
JOB LOCATION
Los Angeles, CA

REQUIREMENTS
DOCUMENTS
Curriculum Vitae - Your most recently updated C.V.
Cover Letter
Examples of Work
URL links with relevant videos & web content

REFERENCES
3-5 references required (contact information only)

HOW TO APPLY
1 Create an ApplicantID
2 Provide required information and documents
If any, provide required reference information

JOB LOCATION

Los Angeles, CA

REQUIREMENTS

DOCUMENTS

- Curriculum Vitae - Your most recently updated C.V.
- Cover Letter
- Examples of Work
- URL links with relevant videos & web content
- Statement of Contributions to Diversity - Statement addressing past and/or potential contributions to diversity through research, teaching, and/or service. (Optional)
- Misc / Additional (Optional)

REFERENCES

3-5 letters of reference required

HOW TO APPLY

1. Create an ApplicantID
2. Provide required information and documents
3. If any, provide required reference information

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TECHNOLOGY

THE NEAR FUTURE

Three Top Firms That are Pursuing Design Research

Perkins+Will, The Living, and KieranTimberlake are among a new class of architectural practices investing in research.

By DANIEL DAVIS

In architecture, it can be difficult to determine where research ends and practice begins. In sectors such as medicine and aerospace, research is distinct from the rest of the business. But architectural research tends to mix with practice. Some argue that design and research are intertwined—that architects are conducting research as their design process leads them to better understand the site and other peculiarities of the project. In this guise, all design is a form of research.

While design may be considered as a form of research, not all research is a form of design. Ajla Aksamija, leader of Perkins+Will's Tech Lab and co-organizer for this year's Architectural Research Centers Consortium, says that differentiating between actual research and mere marketing is essential. Firms may claim to do research as part of their design initiatives, but historically, few firms have actually invested in research.

That appears to be changing, albeit slowly. "In the last decade, we have seen an increase in practices that are integrating research into their design processes and services," Aksamija says. "The current technological innovation and complexity of design processes are requiring more research and integration between specialists."

Recent technological innovations have given rise to a number of specializations within architecture firms. Practices now employ computational design specialists, material consultants, and sustainability experts. These are all jobs that largely didn't exist 10 or 20 years ago. And these experts don't have an established body of knowledge to work from. Instead, they are developing the knowledge *pro re nata*—or, as it's required.

ABOUT THE AUTHOR

Daniel Davis

Daniel Davis is researcher at former senior at Case, Inc. He is a regular contrib Near Future, a monthly column tha technology and its role in advancin architecture.

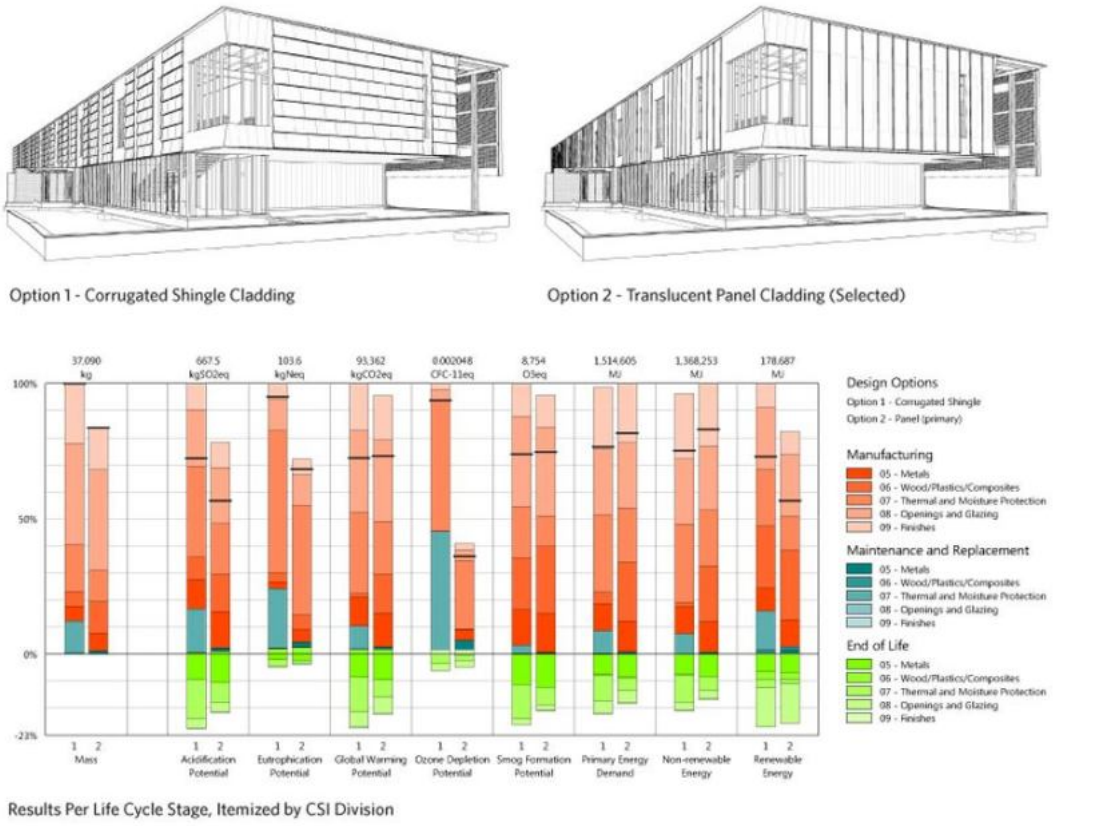
Courtesy The Living

A rendering of an aerial view of the The Living's Hy-Fi, the winning design of the 2014 Young Architects Program

David Benjamin, co-founder of The Living (which was acquired by Autodesk last summer) and director of Columbia University's Living Architecture Lab, stands in this nexus between research and architecture. Regarding The Living's 2014 installation (above) for the Museum of Modern Art P.S. 1 Young Architects Program competition, which was constructed from biodegradable bricks of fungus, Benjamin says, "There is no drop-down selection box for 'mushroom material' in structural analysis software." To complete the project, he had to get his hands on the bricks to understand their architectural potential and to test their material performance. This type of research is typical for Benjamin, whose practice frequently integrates developments in material science, biology, and design computation.

Aksamija joined Perkins+Will in 2008 to lead the firm's then-newly formed Tech Lab. Its research into high-performance design, sustainability, and computational design frequently appears in Perkins+Will's peer-reviewed research journal, which features studies whose topics range from the effects of therapeutic gardens on children with Autism Spectrum Disorder to those that measure how lean construction affects project-completion times. While the studies have the potential to inform future design projects, they were almost always developed outside the course of ordinary design work. Even the act of publishing a research journal sits beyond the typical mandate of an architectural office.

KieranTimberlake, in Philadelphia, also uses research to advance its practice. Billie Faircloth, AIA, a partner at the firm who directs its research, explains the practice's philosophy as one of continually searching. "Research is a design philosophy that is intrinsic to what we do," she says, adding that it is always happening in practice, whether through learning about a new material or implementing a new process. The question, she says, is: "How far do we go in terms of the kind of knowledge we create?"



KieranTimberlake

An output report from KieranTimberlake's Tally summarizes a project's environmental impacts across eight categories.

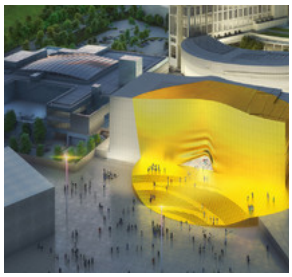
Most of KieranTimberlake's research focuses on novel construction methods, environmental analysis, and custom modeling. Among other projects, it has led them to embed sensors in two rooms of Yale University's Sage Bowers Hall. For a year, the team collected data on temperature, humidity, lighting, and energy consumption in order to understand the building's real conditions. This proved so successful that KieranTimberlake subsequently developed its own range of custom wireless sensors to monitor site conditions. The firm has continued to refine its sensor technology, which won an ARCHITECT R+D Award in 2013.

This fusion of software development and building performance is typical of the firm's research. Recently, KieranTimberlake partnered with Autodesk and sustainability software consultant PE International to improve life-cycle assessments of materials in BIM models. This research led them to develop Tally, environmental life-cycle software that the firm now offers as an Autodesk Revit app to other practices.

Innovations in building technology and building performance are profoundly altering the way in which architects practice. For firms such as Perkins+Will, The Living, and KieranTimberlake, their research enables them to become active participants rather than reactionary bystanders in this process.

Like Aksamija and Benjamin, Faircloth is optimistic about the future of practice-led research. "There are incredibly profound opportunities in our industry," she says.

As the pace of innovation quickens, these opportunities may become necessities. Already far more specialists are involved in the production of architecture than in the past. And we are seeing signs that these knowledge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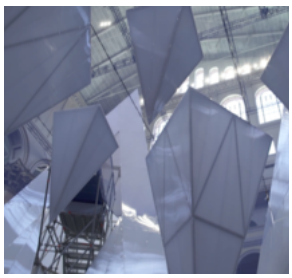
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workers are increasingly becoming knowledge generators. While architecture hasn't traditionally involved researching the structural strength of fungus, or developing electronic sensors and selling environmental analysis software, some firms are now asking why not? If technology is going to change architecture, why shouldn't it be architects who lead the research and development?

Daniel Davis is a senior researcher at Case, Inc. His technology column will appear on this website each month. His views and conclusions are not necessarily those of ARCHITECT magazine or of the AIA.

Keywords:

SUBJECT:

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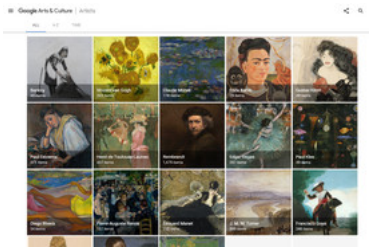

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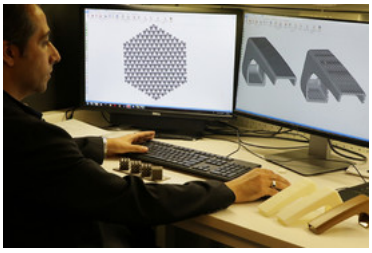

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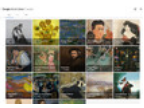

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