



**University of Northern California**

# Catalog

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**Volume 20**

**2015-2016**

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**The University of Northern California updates its catalog annually. If there are any changes in institutional policies and procedures or government agencies rules and regulations, the catalog will be updated to reflect these changes. All information contained in this Catalog is current, correct, and certified as true.**

**As a prospective student, you are encouraged to review this catalog prior to signing an enrollment agreement. You are also encouraged to review the School Performance Fact Sheet, which must be provided to you prior to signing an enrollment agreement.**

**The University of Northern California is a private university and is not affiliated with the University of California or California State University or any of their campuses.**



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# 1. ACADEMIC CALENDAR September 1, 2015 – December 31, 2016

Fall Semester	September 1, 2015 – December 17, 2015
Winter Break	December 18, 2015 - January 10, 2016
Spring Semester	January 11, 2016 - April 29, 2016
Spring Break	April 30, 2016 - May 8, 2016
Summer Session	May 9, 2016 - August 19, 2016
Summer Break	August 20, 2016 - September 5, 2016
Fall Semester	September 6, 2016 - December 16, 2016
Winter Break	December 17, 2016 - January 8, 2017

## Holidays

New Year's Day  
Memorial Day  
Independent Day  
Labor Day  
Thanksgiving Holidays  
Christmas Day

## **2. THE UNIVERSITY OF NORTHERN CALIFORNIA**

### **2.1 ABOUT UNIVERSITY OF NORTHERN CALIFORNIA (UNC)**

The University of Northern California (UNC) is a young private university welcoming students from around the world. UNC was established in May 1993, and opened to students in August 1995. At UNC, students enjoy small classes with ample individual attention from professors dedicated to quality teaching. UNC's faculty members are committed to helping students to develop a solid academic foundation with a practical focus. UNC's academic programs emphasize the importance of effective communication for success in the 21st century.

The University of Northern California aspires to become a premiere engineering and technological university. Its special focus is on programs in biomedical technology including the M.S., PhD and professional doctoral degrees in biomedical engineering.

The University of Northern California is situated in a Business Park in Rohnert Park, California. The location provides an ideal environment for learning. Rohnert Park is within the San Francisco Bay Area, one of the largest metropolitan regions of the United States. Beautiful beaches, redwood forests, wine country, mountain hiking trails, campgrounds, horseback riding facilities and golf courses are just minutes away. Also within easy access from UNC are outstanding museums, restaurants, performing arts companies, cultural festivals, and major-league sports teams.

### **2.2 INSTITUTIONAL APPROVALS AND AUTHORIZATIONS**

The University of Northern California (UNC) is a private institution which received institutional approval to operate as a degree granting institution by the former Bureau for Private Postsecondary and Vocational Education (BPPVE) as well as its successor: the Bureau for Private Postsecondary Education (BPPE). Its institutional number is 4901161.

Any questions a student may have regarding this Catalog that have not been satisfactorily answered by the institution may be directed to the Bureau for Private Postsecondary Education at:

Address: 2535 Capitol Oaks Drive, Suite 400, Sacramento, CA 95833

P.O. Box 980818, West Sacramento, CA 95798-0818

Web site Address: [www.bppe.ca.gov](http://www.bppe.ca.gov)

Telephone and Fax #'s: (888) 370-7589 or by fax (916) 263-1897

(916) 431-6959 or by fax (916) 263-1897

## **2.3 MISSION STATEMENT**

**The University of Northern California is dedicated to advancing scientific and technological innovations in biomedical engineering through its educational and research programs. All programs emphasize applications to biology and medicine.**

## **2.4 INSTITUTIONAL PURPOSE AND OBJECTIVES**

The University of Northern California (UNC) is a teaching and research university that seeks to make higher education available to students regardless of their country of origin or native language. UNC encourages a strong sense of multicultural and inter-disciplinary academic community among its students and staff. Its graduate programs in engineering are designed to foster technical, analytical and communicative skills. These skills enhance each student's potential for personal and professional success in an increasingly technology-driven and communication interdependent world. UNC provides students with the skills and confidence to engage in interdisciplinary cooperation that is the hope for improving the long-range prospects for the human species.

College-level students of strong academic ability with minor deficiencies in prerequisite knowledge are also welcome. Academically strong students who require additional quantitative and analytical skills for successful enrollment in any degree program will be offered a program of study appropriate for their initial abilities and academic goals at UNC or at a neighboring institution.

To meet the foregoing mission, the University offers academic programs leading to M.S., PhD, and professional doctorate degrees. These degree programs include a M.S. and both an academic and professional doctoral degree in Biomedical Engineering. Additional degree programs will be added as UNC continues to grow.

To the extent that it is financially able, the University will assist qualified students in meeting the financial costs of their education. Such assistance will be based on a student's academic ability and financial need, and presumes that students and their families have gone as far as they can in meeting these costs themselves.

The University of Northern California does not discriminate on the basis of race, national origin, color, religion, gender, sexual orientation, age, or physical disability.

## **2.5 PHYSICAL FACILITIES**

University of Northern California campus is where academic vigor and innovative research interface with biomedical device development and the incubation of company spin-offs. The campus is located in the SoCo Nexus business incubator, at Rohnert Park, California. The campus' physical facilities consist of classrooms, library, study areas, student cubicles, Research and Development laboratory, Community Clinic, and administrative offices. The campus lay-out enables students and faculty the opportunity to study, conduct research, and work alongside the

SoCo Nexus start-up companies' engineers, administrators, marketing, sales, quality, and regulatory personnel.

All class sessions are held on campus at 1300 Valley House Drive, Suite 100-27, Rohnert Park, CA 94928.

### **Library Facilities**

The UNC biomedical library is housed in a centrally located part of the campus suites and includes a reading area, study carrels and Internet connected computers. At present, the library contains approximately 950 biomedical technology related volumes and journals. Students also have access to the library resources at Sonoma State University (SSU) by joining the Community Borrowers program. UNC will reimburse students for any costs (\$10.00 every three months) related to the joining the program. The SSU Campus is 1.5 miles from UNC. Students, as Sonoma County residents, may also use the North Bay Cooperative Library Service by obtaining a free library card from any local public library in the North Bay area.

### **Computers and Data Base**

UNC's Website address is: [www.uncm.edu](http://www.uncm.edu) and the main e-mail address is: [admits@uncm.edu](mailto:admits@uncm.edu). The University strongly encourages every student to purchase a computer that will permit the student to network with the campus' local area network (LAN).

## **2.6 ADMISSIONS**

The University of Northern California admits applicants on the basis of their standard examination scores and their previous academic record, letters of reference, and a personal essay.

Non-native speakers of English must submit either an official Test of English as a Foreign Language (TOEFL), and score must be at least 500 for the paper-and-pencil test, at least 173 for the computer-based test, or at least 61 for the Internet-based test (iBT). For other students, a minimum score of 640 in the Japanese Society for Testing English Proficiency, Inc. (STEP) is required. In either case, the UNC ESL faculty will test international students for their speaking, listening, reading and writing abilities upon their arrival before they are allowed to enroll in regular university classes.

Preference for admission and scholarships will be given to those applicants who have the highest standard examination scores, positive references and a college record indicating they are most likely to succeed in the program for which they are applying.

## **GRADUATE PROGRAMS**

Students wishing to enroll in a program of graduate study leading to a master's or PhD or a professional doctorate degree must possess a bachelor's degree or its equivalent. Students who have a bachelor's degree in an engineering curriculum or in a curriculum in the biological, mathematical or physical sciences, who have a 3.00 minimum grade-point average and an acceptable score on the Graduate Record Examination (GRE) General Test (combined verbal and quantitative score of 310), are eligible to be considered for admission to Master of Science studies. Students may, under exceptional circumstances, be considered for conditional admission with a lower grade-point average and/or a lower GRE General Test score. Students on conditional status must achieve regular status within 9 semester credit hours of initial registration by attaining a 3.00 minimum grade-point average at the University of Northern California and regular acceptance by the departmental faculty. Students who do not meet these requirements are subject to dismissal.

Reference letters, research interests, previous graduate study grade-point average, and other factors may be considered in making admission decisions. Students qualified for graduate study are eligible to apply for graduate teaching and/or research assistantships as well as internships at the Science and Technology Innovation Center's (STIC) startup companies.

### **Applying for Graduate Admission**

1. Obtain an Application for Graduate Admission either by downloading the Application Form from our web site: [www.uncm.edu](http://www.uncm.edu) or by contacting the Office of Admissions at 707-331-1110 or by writing to the UNC Office of Admissions.
2. Fill out the application, being careful to answer all the applicable questions, and complete the essay.
3. Mail the completed application form along with the nonrefundable \$100.00 application fee to the Office of Admissions.
4. Have official copies of your previous college transcripts sent to the Office of Admissions. If applying for transfer, upper division admission, or Graduate School, have official copies of your college transcripts sent to the Office of Admissions.
5. If applying for graduate admission, submit official results of your Graduate Record Examination (GRE). International students with appropriate credentials may be exempted from this requirement.

International students, whose first language is not English, must additionally submit official results of either the Test Of English as a Foreign Language (TOEFL) or the Japanese Society for Testing English Proficiency, Inc. (STEP). The following codes should be used for the reporting of test scores:

TOEFL – 4935;      GRE - must be directly submitted by applicant.

Note: All information, once submitted, becomes the property of the University of Northern California and will not be returned.

## **WHEN TO APPLY**

Application to the University can be made at any time of the year as we have rolling admission dates. Students should allow reasonable time for the processing of their applications.

## **NOTIFICATION OF ADMISSION**

The Office of Admissions will promptly acknowledge receipt once an application has been received. However, the process of review of potential students will not begin until all documents have been received and the \$100.00 application fee paid. Once the review has been completed, a letter will be sent to the applicant explaining his/her admission status. The letter will either be faxed or scanned and e-mailed to you. Students may anticipate receiving a decision from the Admissions Committee (admissions staff, academic chair, and Dean of Students) within three weeks.

## **ENROLLMENT DEPOSIT**

Once a student has reviewed the UNC catalog, toured the campus and been accepted for admission, he/she will receive an enrollment agreement form which must be signed and returned with the enrollment deposit of \$100.00 not less than four weeks before the first day of classes. Exceptionally, students who are unable to visit the campus prior to enrollment, e.g., applicants residing abroad, may sign the enrollment agreement form after their arrival on campus. This non-refundable enrollment deposit will be applied to the registration fee for the term of admission.

## **TRANSFERRING-IN UNITS OF CREDIT**

The University of Northern California grants semester credit units for certain courses completed at other colleges and universities. To receive credit units, the student must submit to the Registrar a written request and an official transcript from the institution(s) previously attended. The Chief Academic Officer in conjunction with the Program Chair of the program the student is applying will make decisions regarding the acceptance of credit units earned elsewhere.

The maximum number of credits that UNC will accept in transfer from a US Department of Education recognized accredited institution are:

- Master's Program: a maximum of 15 credits that are directly related to the program's field of study
- Doctoral Program: a Masters degree in engineering plus a maximum of 15 credits that are directly related to the program's field of study

UNC has not entered into an articulation or transfer agreement with any other college or university.

## **TRANSFERRING-OUT UNITS OF CREDIT**

### **NOTICE CONCERNING TRANSFERABILITY OF CREDITS AND CREDENTIALS**

**EARNED AT OUR INSTITUTION: The transferability of credits you earn at University of Northern California is at the complete discretion of an institution to which you may seek to transfer. Acceptance of the degree, diploma, or certificate you earn in your program is also at the complete discretion of the institution to which you may seek to transfer. If the credits, degree, or diploma that you earn at this institution are not accepted at the institution to which you seek to transfer, you may be required to repeat some or all of your coursework at that institution. For this reason you should make certain that your attendance at this institution will meet your educational goals. This may include contacting an institution to which you may seek to transfer after attending the University of Northern California to determine if your credits, degree, diploma or certificate will transfer.**

## **2.7 FINANCIAL AID**

It is the goal of the University of Northern California to provide a package of financial assistance that will enable eligible graduate students to meet their tuition and living expenses. The University of Northern California Foundation (UNC Foundation) distributes funds on the basis of financial need and/or demonstrated potential for scholastic achievement in the following programs:

Scholarships  
Work Study  
Graduate Fellowships  
Teaching and Research Assistantships  
Internship at STIC-affiliated companies

Eligibility for Work Study is dependent on the ability of the applicants to demonstrate financial need. Candidates for Scholarships, Graduate Fellowships and Teaching Assistant and Research Assistant positions will be judged and awarded funding on the basis of scholarship and financial need. The University of Northern California does not participate in federal and state financial aid programs.

## **STUDENT LOANS**

UNC does not participate in federal or state financial aid programs.

If a student obtains a loan to pay for an educational program, the student will have the responsibility to repay the full amount of the loan plus interest, less the amount of any refund.

If a student is eligible for a loan guaranteed by the federal or state government and the student defaults on the loan, both of the following may occur:

- A. The federal or state government or a loan guarantee agency may take action against the student, including applying any income tax refund to which the person is entitled to reduce the balance owed on the loan.

- B. The student may not be eligible for any other federal student financial aid at another institution or other government assistance until the loan is repaid.

The University of Northern California Foundation offers Presidential Scholarships and Foundation Scholarships for graduate students. Students who wish to be considered for these scholarships will submit:

Completed Application for Admission  
Completed Application for Financial Assistance  
Official SAT, ACT or other standardized test scores (Scores are not required for transfer students having over 24 transferable units.)  
GRE test scores for Graduate Applicants.  
TOEFL test scores for international applicants  
Three letters of reference

Students interested in applying for financial assistance need to obtain an application for Financial Assistance form by contacting:

Director of Financial Assistance  
University of Northern California  
1300 Valley House Drive, Suite 100-27  
Rohnert Park, CA 94928  
707-644-6364

Upon Admission to UNC, the Application for Financial Assistance form will either be faxed or scanned and e-mailed to you when you request it.

## **2.8 STUDENT HEALTH INSURANCE**

All full-time students are required to show proof of personal health insurance for each semester of enrollment. The University can provide basic health care policies for both domestic and international students. These policies are available at a competitive current market price. Once admitted to the University, students must also complete a medical history form including all information about prior immunizations.

## **2.9 HOUSING INFORMATION**

Students are responsible for providing their own housing while attending UNC. The University does not have dormitories or other housing available to students. UNC Student Services will assist students in their search for housing. However, it is the student's responsibility, not UNC's, to secure their accommodation while attending UNC. One bedroom apartments are available in Rohnert Park area for approximately \$1000-\$1500 per month. A two-bedroom townhouse or apartment rents for about \$1,800-\$2,200 per month not including utilities. Food costs vary. A minimum of \$200 per month for food should be expected.

## **2.10 INTERNATIONAL STUDENTS**

One of the most effective ways to increase one's understanding of other languages and cultures as well as improving one's ability to function effectively in an interdependent world, is to take advantage of the educational opportunities available in other countries. Those international students who take advantage of this opportunity will broaden their global perspective and appreciation for different points of view by taking part in a dynamic interchange of diverse ideas and approaches while living and studying in another country.

After receipt and acceptance of the Application for Admission form and a \$100.00 pre-registration tuition deposit, the University of Northern California will provide a United States Citizenship and Immigration Services (USCIS) SEVIS I-20 Form, which will allow a student to apply for a F-1 student visa. Students on an F-1 visa must enroll, maintain continuous attendance and satisfactorily complete each semester, at least 9 credits of graduate study at UNC. Before registration, F-1 students transferring from a high school, college or university in the United States must submit a Transfer Verification Form that will be sent to them by the Office of Admissions either by fax or scanned and e-mailed to you.

## **2.11 BANKRUPTCY DISCLOSURE**

The University of Northern California does NOT have pending a petition in bankruptcy, is NOT operating as a debtor in possession, has NOT filed a petition within the preceding five years, and has NOT had a petition in bankruptcy filed against it within the preceding five years that resulted in reorganization under Chapter 11 of the United States Bankruptcy Code.

## **2.12 STATEMENT CONCERNING ACCREDITATION**

The University of Northern California is not accredited by an accrediting agency recognized by the US Department of Education. This means that UNC's programs have the following limitation:

- A. A graduate of a UNC degree program may not be eligible to sit for an applicable licensure exam in California and other states.
- B. A UNC degree is not recognized for some employment positions, including, but not limited to, positions with the State of California.
- C. A UNC student is not eligible for federal financial aid programs.

## **2.13 POLICY ON INSTRUCTIONAL LANGUAGE**

The University of Northern California utilizes English for all instruction.

## **2.14 POLICY ON PROVIDING CREDIT FOR PRIOR EXPERIENTIAL LEARNING**

The University of Northern California (UNC) does not award credits for prior experiential learning in which an applicant participated before enrolling in UNC. Due to the fact that UNC does not award credits for prior experiential learning, there are no provisions available for appeal.

For enrolled students, credits are awarded for Curricular Practical Training (CPT) work and/or research experiences that are deemed integral to the student's program curricula and are approved by the Program's Chair prior to the student's participation in the CPT experience.

## **2.15 UNC PROGRAMS AND LICENSURE**

None of the University of Northern California programs are designed to lead to positions in a profession, occupation, trade, or career field requiring licensure in the state of California.

## **2.16 DISTANCE EDUCATION**

The University of Northern California does not offer programs or courses via distance education. All UNC programs and courses are residential and taught on campus.

### **3. ACADEMIC PROGRAMS AND COURSE LISTINGS**

#### **Biomedical Engineering**

The past five decades have seen tremendous growth of technological activity in biology and medicine. Engineers are increasingly becoming involved in the life and health sciences. Accordingly, they have a great need to become more familiar with these fields in order for them to apply the tools of engineering and physics to biology and medicine. Conversely, students of biomedicine are required to become conversant with physics, mathematics and engineering in addition to chemistry. Recognition of this need brought about the emergence of a new interdisciplinary engineering activity known as biomedical engineering that was designed to bridge the gap between the life sciences, medicine and engineering.

#### **3.1 MASTER OF SCIENCE IN BIOMEDICAL ENGINEERING**

##### **Program Description:**

The Master of Science in Biomedical Engineering is thirty (30) semester credits in length consisting of seven (7) three-credit core biomedical engineering M.S. courses for a total of twenty-one (21) academic course credits. In addition, the program requires the completion of a nine (9) credit thesis research project. Together the program's core academic courses and the thesis research work add up to the thirty (30) semester hour M.S. degree requirement. The M.S. degree is designed to be completed over three (3) trimesters, which is the equivalent of 1-1/2 calendar years, depending on the length of time it takes the student to complete his or her thesis project.

##### **Mission and Objectives:**

The mission of graduate studies at the Master of Science level is to educate students in the essential foundations of Biomedical Engineering. These essentials include students gaining theoretical and hands-on practical knowledge in areas of biomechanics (biosolid and biofluid mechanics), biomaterials, biomedical image analysis, bioinstrumentation, biophotonics, diagnostic and therapeutic biomedical devices. The goal is to enable students to utilize contemporary biomedical engineering methodologies at an advanced level as preparation for a professional career in biomedical engineering design, development, and research.

The Biomedical Engineering M.S. program prepares students for careers in medical instrumentation, diagnostic aids, safety engineering, rehabilitation engineering, life support systems, human-machine systems, prosthetics and orthotics. Graduates can find employment in the biomedical device industry and/or biotechnology. Graduates may also pursue careers in government, e.g., Veterans Administration, National Institutes of Health, Environmental Protection Agency, Food and Drug Administration, and Centers for Disease Control. Many biomedical engineering graduates elect to continue their formal education in the engineering, dental, medical or legal professions.

##### **Admission Requirements:**

The M.S. program in Biomedical Engineering at the University of Northern California admits applicants on the basis of their previous academic record, standardized test scores, letters of

recommendation, and a personal essay. Students must possess a Bachelor's degree in Engineering or in its equivalent in a related field such as mathematics or physical sciences. Students with a Master's degree in other fields may be considered for admission based upon previous coursework or experience in the related fields. Admission to the M.S. program requires a 3.00 minimum grade point average in previous undergraduate and/or professional studies.

**International Students:**

Non-native speakers of English must submit either an official Test Of English as a Foreign Language (TOEFL) must be at least 500 for the paper-and-pencil test, at least 173 for the computer-based test, or at least 61 for the Internet-based test (iBT). For other students, a minimum score of 640 in the Japanese Society for Testing English Proficiency, Inc. (STEP) is required. In either case, the UNC faculty will appraise international students for their speaking, listening, reading and writing abilities upon their arrival before they are allowed to enroll in regular university classes.

**Mode of Instruction:**

The mode of instruction varies depending on the nature of the individual classes, and is based on traditional lecture, instructor-led discussion, seminar-style student group discussion, laboratory projects and investigations leading to completion of the M.S. thesis research project.

**Graduation Requirements:**

The M.S. in biomedical engineering requires a minimum of 30 semester credits of course work and research beyond the bachelor's level. The program requires the completion of a thesis research project which counts for nine credit hours towards satisfying the 30-semester hour M.S. degree requirement. The M.S. degree may be a terminal degree or an intermediate step toward a PhD or DBME degree. To earn the M.S., students are required to attain a 3.00 minimum grade-point average on a minimum of 30 semester credits of graduate work. The requirements for the M.S. degree may be completed in one calendar year consisting of three (3) trimesters.

**Program Curriculum:**

The curriculum for the M.S program is designed to facilitate students' theoretical and hands-on practical knowledge in the essential foundations of Biomedical Engineering. To accomplish this task, the curriculum consists of seven (7) core courses that provide students with expertise in the various biomedical engineering disciplines. (Note: to substitute a core course with an alternative course a student must obtain written permission from his or her faculty advisor and the program chair.) The program curriculum concludes with a student conducting a thesis research project. This project enables a student to deepen his or her understanding of a specific biomedical engineering field of interest. (Note: faculty advisor approval is required before a student can start a thesis research project.)

**Program Core Courses:**

BME	310 I (3 credits)	Medical Terminology for Biomedical Engineers
BME	310 II (3 credits)	Anatomy & Physiology for Biomedical Engineers
BME	320 (3 credits)	Introduction to Biomechanics
BME	420 (3 credits)	Introduction to Biomaterials
BME	480 (3 credits)	Optical Engineering in Biomedicine

MTH 410 (3 credits) Introduction to Biostatistics  
MTH 420 (3 credits) Design and Analysis of Experiments

Thesis Project  
BME 510 (9 credits) Individual Investigations in Biomedical Engineering

### **Course Sequence:**

#### Trimester I (12 credits total)

BME 310 I Medical Terminology for Biomedical Engineers  
BME 310 II Anatomy & Physiology for Biomedical Engineers  
BME 320 Introduction to Biomechanics  
MAT 410 Introduction to Biostatistics

#### Trimester II (9 credits total)

BME 420 Introduction to Biomaterials  
BME 480 Optical Engineering in Biomedicine  
MAT 420 Design and Analysis of Experiment

#### Trimester III (9 credits total)

BME 510 Individual Investigations in Biomedical Engineering

### **M. S. in Biomedical Engineering Program Core Course Descriptions:**

**BME 310 I Medical Terminology for Biomedical Engineers (3 credits)**

Fundamentals of how medical terminology is constructed with emphasis on the three basic parts to medical terms: a word root; a prefix; and a suffix. Terminology related to all body systems are covered.

**BME 310 II Anatomy & Physiology for Biomedical Engineers (3 credits)**

Basics of cell function, organ systems, and principles of functional anatomy and physiology applied to the field of biomedical engineering.

**BME 320 Introduction to Biomechanics (3 credits)**

Principles of solid mechanics applied to biomedical systems: emphasis on analytical and experimental applications to the human musculoskeletal system.

Corequisite: BME 310 I and BME 310 II

**BME 420 Introduction to Biomaterials (3 credits)**

Material properties, biocompatibility characteristics, performance requirements of materials for in vivo implants.

Corequisite: BME 310 I and BME 310 II

**BME 480 Optical Engineering in Biomedicine (3 credits)**

Introduction of optical and photonic engineering to biomedicine. Concepts of interference and coherence, Fourier transform and Fourier optics, image and signal processing, holography, fiber optics, lasers, instrumentation. Case study in biomedical optics.

**BME 510 Individual Investigations in Biomedical Engineering (9 credits)**

Individual projects for biomedical engineering graduate students. Investigations could be: laboratory studies, research, engineering design projects, analysis and simulation of a bioengineering system, computer software development.

Prerequisite: Consent of instructor.

**MAT 410 (3 credits) Introduction to Biostatistics**

Descriptive statistics, exploratory data analysis, random variables, important discrete and continuous distribution, point and interval estimation, tests of hypotheses, regression, design of experiments including factorial and fractional factorial designs.

**MTH 420 (3 credits) Design and Analysis of Experiments**

How to plan, design, and conduct experiments efficiently and effectively; how to analyze the resulting data to obtain objective conclusions. Applications from various fields of engineering (including chemical, mechanical, materials science, etc.), as well as the health sciences, are illustrated throughout the course.

**Biomedical Engineering Equipment available at UNC**

The University of Northern California owns the biomedical engineering equipment listed below. Familiarity with this equipment is essential to successful biomedical research. Students are taught how to use the equipment through-out the program - during course work and research lab experiences. The equipment is available for students' independent projects and MS thesis research.

**MTS Materials Testing Machine**

This major piece of equipment allows students and researchers to get hands-on experience on all the experimental aspects of the mechanics of materials testing in general and biomechanics and biomaterials in particular.

**Morphometer**

This instrument allows for the conversion of a point on a 3D object (with irregular geometry) into its Cartesian coordinates.

**Center of Gravity Apparatus**

Small and large board and scale apparatus used to determine the surface intercepts of the center of gravity (CG) of irregular 3-D objects including the CG of the human body.

**Pressure Measuring Mat**

The pressure-measuring mat, consisting of a 28 by 28 array of capacitance-type pressure transducers, converts changes in capacitance to changes in pressure.

### Drop Tower

The drop tower is a device used to test the dynamic structural and/or material properties of objects.

### Bone Processing Laboratory

Equipment used to separate inorganic bone from its organic phase by means of a bone saw, a freezer mill, particle-sorting sieves and a laboratory refrigerator.

### Bio-Photonics Research Laboratory

HeNe laser, laser diode, photo detector, lenses, optical rails, optical cube beam splitter, opto-mechanical holders, linear translation and rotation stages, oscilloscopes, image processing software, 100 x to 1000 x medical grade microscope, digital cameras, videos cameras.

## **3.2 DOCTOR OF BIOMEDICAL ENGINEERING (DBME)**

### **Program Description:**

The Doctor of Biomedical Engineering (DBME) program is a professional degree consisting of thirty (30) semester credits in length. Of the 30 credits, eighteen (18) of the credits are obtained by successfully completing the program's six (6) three-credit core biomedical engineering academic courses. The additional twelve (12) credits are earned through the completion of a twelve (12) credit dissertation research project. Together the program's core academic courses and the dissertation research work add up to the thirty (30) semester hour DBME degree requirement. The academic course work for the DBME degree is designed to be completed over two (2) semesters. Dissertation research and writing may take from one to four (4) additional years to complete.

### **Mission and Objectives:**

The mission of graduate studies at the DBME level is to prepare students for research, leadership and management positions in the biotechnology and biomedical industries. The program accomplishes this mission by assisting students in the mastery of the essential foundations of biomedical engineering. These essentials include students gaining expert theoretical and practical knowledge in areas of biomechanics (biosolid and biofluid mechanics), biomaterials, biomedical image analysis, bioinstrumentation, biophotonics, and therapeutic biomedical devices. The goal is to enable students to utilize contemporary biomedical engineering methodologies at an advanced level as preparation for a professional career in biomedical engineering design, development, and research.

Graduates are prepared for employment in the biomedical device industry and/or biotechnology. Graduates may also pursue careers in government, e.g., Veterans Administration, National Institutes of Health, Environmental Protection Agency, Food and Drug Administration, and Centers for Disease Control.

### **Admission Requirements:**

Students wishing to enroll in the DBME program must possess a Master's degree in an engineering, mathematics, biological sciences, physical sciences, or related field with a minimum of 30 semester credits that can be transferred from an accredited institution of higher education. Admission to the DBME program is conditional until a student has successfully completed a qualifying interview with the department chair.

### **Mode of Instruction:**

The mode of instruction varies depending on the nature of the individual classes, and is based on traditional lecture, instructor-led discussion, seminar-style student group discussion, laboratory projects and investigations leading to completion of the DBME dissertation.

### **Graduation Requirements:**

The DBME program, including acceptable transfer credit hours, requires a minimum of 60 semester credit hours of graduate work beyond the Bachelor's degree. Of these 60 hours, at least 12 credit hours must be in dissertation research. Students entering the doctoral program with a Master's degree receive, at a minimum, 30 credits in transfer. Students are required to successfully complete, at a minimum, 15 program-related credits at UNC. Based on research progress, examination results

or other measures, the student's graduate committee may require additional formal course work in order to strengthen areas of perceived weakness.

A 3.25 minimum grade-point average must be maintained throughout DBME studies. Upon completion of the course work specified in the plan of study, with the grade-point average stipulated above, and upon their adviser's recommendation, students conclude their program by successfully completing and defending their dissertation before their committee and their peers.

### **Program Curriculum:**

Students enjoy close working relationships with the faculty, promoted by small class sizes and joint research projects. The core curriculum provides students with the necessary foundation of knowledge in the discipline.

### **Program Core Courses**

BME 310 I (3 credits)	Medical Terminology for Biomedical Engineers
BME 310 II (3 credits)	Anatomy & Physiology for Biomedical Engineers
BME 440 (3 credits)	Biomedical Engineering Systems Design
BME 530 (3 credits)	Advanced Biomechanics
BME 510 (3-9 credits)	Individual Investigations in Biomedical Engineering
MTH 420 (3 credits)	Design and Analysis of Experiments
BME 660 (12 credits)	Dissertation Research in Biomedical Engineering

### **Elective Courses**

Note: to substitute a core course with an alternative course a student must obtain written permission from his or her faculty advisor and the program chair.

### **Recommended Course Sequence:**

#### Semester I (9 credits total)

BME 310 I	Medical Terminology for Biomedical Engineers
BME 310 II	Anatomy & Physiology for Biomedical Engineers
MAT 420	Design and Analysis of Experiment

#### Semester II (9 credits total)

BME 440	Biomedical Engineering Systems Design
BME 530	Advanced Biomechanics
BME 510	Individual Investigations in Biomedical Engineering

#### Semester III (12 credits total)

BME 660	Dissertation Research in Biomedical Engineering
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### **Program Core Course Descriptions:**

MTH 420 (3 credits) Design and Analysis of Experiments

How to plan, design, and conduct experiments efficiently and effectively; how to analyze the resulting data to obtain objective conclusions. Applications from various fields of engineering

(including chemical, mechanical, materials science, etc.), as well as the health sciences, are illustrated throughout the course.

**BME 310 I Medical Terminology for Biomedical Engineers (3 credits)**

Fundamentals of how medical terminology is constructed with emphasis on the three basic parts to medical terms: a word root; a prefix; and a suffix. Terminology related to all body systems are covered.

**BME 310 II Anatomy & Physiology for Biomedical Engineers (3 credits)**

Basics of cell function, organ systems, and principles of functional anatomy and physiology applied to the field of biomedical engineering.

**BME 440 Biomedical Engineering Systems Design**

Design of system elements; prosthesis; biomaterials; case study of biomechanical systems, computer-aided design methods, design of subsystems, product reliability, medical legal considerations.

**BME 510 Individual Investigations in Biomedical Engineering (3-9 credits)**

Individual projects for biomedical engineering graduate students. Suggested investigations: laboratory studies, research, engineering design projects, analysis and simulation of a bioengineering system, computer software development.

Prerequisite: Consent of instructor. May be taken repeatedly for credit.

**BME 530 Advanced Biomechanics (3 credits)**

Anatomy of the human musculoskeletal system, biomechanical bases of joint degeneration; mechanical properties of hard and soft tissues, three dimensional kinematics and kinetics of human joints. Nonlinear effects in locomotion, optimization methods for the determination of joint forces, spinal biomechanics, design and analysis of artificial joints.

**BME 660 Dissertation Research in Biomedical Engineering (12 credits)**

Experimental and/or analytical investigation of an approved topic for partial fulfillment of the requirements for the professional doctorate dissertation in biomedical engineering. All doctoral students are required to complete 12 credit hours in dissertation research. Enrollment in the Dissertation Research course requires prior approval from the chair of the student's dissertation committee.

Prerequisite: Consent of adviser

**Biomedical Engineering Equipment available at UNC**

The University of Northern California owns the biomedical engineering equipment listed below. Familiarity with this equipment is essential to successful biomedical research. Students are taught how to use the equipment through-out the program - during course work and research lab experiences. The equipment is available for students' independent projects and DBME dissertation research.

#### MTS Materials Testing Machine

This major piece of equipment allows students and researchers to get hands-on experience on all the experimental aspects of the mechanics of materials testing in general and biomechanics and biomaterials in particular.

#### Morphometer

This instrument allows for the conversion of a point on a 3D object (with irregular geometry) into its Cartesian coordinates.

#### Center of Gravity Apparatus

Small and large board and scale apparatus used to determine the surface intercepts of the center of gravity (CG) of irregular 3-D objects including the CG of the human body.

#### Pressure Measuring Mat

The pressure-measuring mat, consisting of a 28 by 28 array of capacitance-type pressure transducers, converts changes in capacitance to changes in pressure.

#### Drop Tower

The drop tower is a device used to test the dynamic structural and/or material properties of objects.

#### Bone Processing Laboratory

Equipment used to separate inorganic bone from its organic phase by means of a bone saw, a freezer mill, particle-sorting sieves and a laboratory refrigerator.

#### Bio-Photonics Research Laboratory

HeNe laser, laser diode, photo detector, lenses, optical rails, optical cube beam splitter, opto-mechanical holders, linear translation and rotation stages, oscilloscopes, image processing software, 100 x to 1000 x medical grade microscope, digital cameras, videos cameras.

### **3.3 DOCTOR OF PHILOSOPHY IN BIOMEDICAL ENGINEERING**

#### **Program Description:**

The Doctor of Philosophy in Biomedical Engineering program is thirty (30) semester credits in length consisting of six (6) three-credit core biomedical engineering courses for a total of eighteen (18) academic course credits. In addition, the program requires the completion of a twelve (12) credit dissertation research project. Together the program's core academic courses and the dissertation research work add up to the thirty (30) semester hour PhD degree requirement. The academic course work for the PhD degree is designed to be completed over two (2) semesters. Dissertation research and writing may take from one to four (4) additional years to complete.

#### **Mission and Objectives:**

The mission of graduate studies at the PhD level is to encourage mastery of the essential foundations of Biomedical Engineering. These essentials include students gaining expert theoretical and practical knowledge in areas of biomechanics (biosolid and biofluid mechanics), biomaterials, biomedical image analysis, bioinstrumentation, biophotonics, and therapeutic biomedical devices. The goal is to enable students to utilize contemporary biomedical engineering methodologies at an advanced level as preparation for a professional career in biomedical engineering design, development, and research.

The Biomedical Engineering PhD program prepares students for research, leadership, and management careers in medical instrumentation, diagnostic aids, safety engineering, rehabilitation engineering, life support systems, human-machine systems, prosthetics and orthotics. Graduates can find employment in the biomedical device industry and/or biotechnology. Graduates may also pursue careers in government, e.g., Veterans Administration, National Institutes of Health, Environmental Protection Agency, Food and Drug Administration, and Centers for Disease Control.

#### **Admission Requirements:**

Students wishing to enroll in Doctor of Philosophy in Biomedical Engineering program must possess a Master's degree in an engineering, mathematics, biological sciences, physical sciences, or related field with a minimum of 30 semester credits that can be transferred from an accredited institution of higher education. Admission to the PhD program is conditional until a student has successfully complete a qualifying interview with the department chair.

#### **Mode of Instruction:**

The mode of instruction varies depending on the nature of the individual classes, and is based on traditional lecture, instructor-led discussion, seminar-style student group discussion, laboratory projects and investigations leading to completion of PhD dissertation.

#### **Graduation Requirements:**

The PhD program, including acceptable transfer credit hours, requires a minimum of 60 semester credit hours of graduate work beyond the Bachelor's degree. Of these 60 hours, at least 12 credit hours must be in dissertation research. Students entering the doctoral program with a Master's degree receive, at a minimum, 30 credits in transfer. Students are required to successfully complete, at a minimum, 15 program related credits at UNC. Based on research progress, examination results

or other measures, the student's graduate committee may require additional formal course work in order to strengthen areas of perceived weakness.

A 3.25 minimum grade-point average must be maintained throughout PhD studies. Upon completion of the course work specified in the plan of study, with the grade-point average stipulated above, and upon the adviser's recommendation, students conclude their program by successfully completing and defending their dissertation before their committee and their peers.

### **Program Curriculum:**

Students enjoy close working relationships with the faculty, promoted by small class sizes and joint research projects. The core curriculum provides students with the necessary foundation of knowledge in the discipline.

### **Program Core Courses**

BME 310 I (3 credits)	Medical Terminology for Biomedical Engineers
BME 310 II (3 credits)	Anatomy & Physiology for Biomedical Engineers
BME 440 (3 credits)	Biomedical Engineering Systems Design
BME 530 (3 credits)	Advanced Biomechanics
BME 510 (3-9 credits)	Individual Investigations in Biomedical Engineering
MTH 420 (3 credits)	Design and Analysis of Experiments
BME 660 (12 credits)	Dissertation Research in Biomedical Engineering

### **Elective Course**

Note: to substitute a core course with an alternative course a student must obtain written permission from his or her faculty advisor and the department chair.

### **Recommended Course Sequence:**

#### **Semester I** (9 credits total)

BME 310 I	Medical Terminology for Biomedical Engineers
BME 310 II	Anatomy & Physiology for Biomedical Engineers
MAT 420	Design and Analysis of Experiment

#### **Semester II** (9 credits total)

BME 440	Biomedical Engineering Systems Design
BME 530	Advanced Biomechanics
BME 510	Individual Investigations in Biomedical Engineering

#### **Semester III** (12 credits total)

BME 660	Dissertation Research in Biomedical Engineering
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### **Program Core Course Descriptions:**

MTH 420 (3 credits) Design and Analysis of Experiments

How to plan, design, and conduct experiments efficiently and effectively; how to analyze the resulting data to obtain objective conclusions. Applications from various fields of engineering

(including chemical, mechanical, materials science, etc.), as well as the health sciences, are illustrated throughout the course.

**BME 310 I Medical Terminology for Biomedical Engineers (3 credits)**

Fundamentals of how medical terminology is constructed with emphasis on the three basic parts to medical terms: a word root; a prefix; and a suffix. Terminology related to all body systems are covered.

**BME 310 II Anatomy & Physiology for Biomedical Engineers (3 credits)**

Basics of cell function, organ systems, and principles of functional anatomy and physiology applied to the field of biomedical engineering.

**BME 440 Biomedical Engineering Systems Design**

Design of system elements; prosthesis; biomaterials; case study of biomechanical systems, computer-aided design methods, design of subsystems, product reliability, medicolegal considerations.

**BME 510 Individual Investigations in Biomedical Engineering (3-9 credits)**

Individual projects for biomedical engineering graduate students. Suggested investigations: laboratory studies, research, engineering design projects, analysis and simulation of a bioengineering system, computer software development.

Prerequisite: Consent of instructor. May be taken repeatedly for credit.

**BME 530 Advanced Biomechanics (3 credits)**

Anatomy and physiology of the human musculoskeletal system; biomechanical bases of joint degeneration; mechanical properties of hard and soft tissues; three dimensional kinematics and kinetics of human joints. Nonlinear effects in locomotion; optimization methods for the determination of joint forces; spinal biomechanics; design and analysis of artificial joints.

**BME 660 Dissertation Research in Biomedical Engineering (12 credits)**

Experimental and/or analytical investigation of an approved topic for partial fulfillment of the requirements for the professional doctorate dissertation in biomedical engineering. All doctoral students are required to complete 12 credit hours in dissertation research. Enrollment in the Dissertation Research course requires prior approval from the chair of the student's dissertation committee.

Prerequisite: Consent of adviser

**Biomedical Engineering Equipment available at UNC**

The University of Northern California owns the biomedical engineering equipment listed below. Familiarity with this equipment is essential to successful biomedical research. Students are taught how to use the equipment through-out the program - during course work and research lab experiences. The equipment is available for students' independent projects and PhD dissertation research.

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This major piece of equipment allows students and researchers to get hands-on experience on all the experimental aspects of the mechanics of materials testing in general and biomechanics and biomaterials in particular.

### Morphometer

This instrument allows for the conversion of a point on a 3D object (with irregular geometry) into its Cartesian coordinates.

### Center of Gravity Apparatus

Small and large board and scale apparatus used to determine the surface intercepts of the center of gravity (CG) of irregular 3-D objects including the CG of the human body.

### Pressure Measuring Mat

The pressure-measuring mat, consisting of a 28 by 28 array of capacitance-type pressure transducers, converts changes in capacitance to changes in pressure.

### Drop Tower

The drop tower is a device used to test the dynamic structural and/or material properties of objects.

### Bone Processing Laboratory

Equipment used to separate inorganic bone from its organic phase by means of a bone saw, a freezer mill, particle-sorting sieves and a laboratory refrigerator.

### Bio-Photonics Research Laboratory

HeNe laser, laser diode, photo detector, lenses, optical rails, optical cube beam splitter, opto-mechanical holders, linear translation and rotation stages, oscilloscopes, image processing software, 100 x to 1000 x medical grade microscope, digital cameras, video camera.

## 4. TUITION, FEES, AND OTHER CHARGES

### 4.1 TUITION FEES

#### Master of Science in BIOMEDICAL ENGINEERING PROGRAM

TUITION PER CREDIT:	\$ 650.00
FULL TIME STUDENT TUITION:	
TRIMESTER I (12 credits):	\$ 7,800.00
TRIMESTER II (9 credits):	\$ 5,850.00
TRIMESTER III (9 credits):	\$ 5,850.00
TUITION COST OF ENTIRE 30 CREDIT PROGRAM:	\$19,500.00
OTHER PROGRAM RELATED FEES:	
Application	\$ 100.00
Textbooks (approximate)	\$ 1500.00
Instructional/Lab Supplies	\$ 250.00
ESTIMATED TOTAL COST OF PROGRAM:	<b><u>\$21,350.00</u></b>

#### DOCTOR OF BIOMEDICAL ENGINEERING PROGRAM (DBME Professional Degree)

TUITION PER CREDIT:	\$ 650.00
FULL TIME STUDENT TUITION:	
SEMESTER I (9 credits):	\$ 5,850.00
SEMESTER II (9 credits):	\$ 5,850.00
DISSERTATION RESEARCH (12 credits):	\$ 7800.00
TUITION COST OF ENTIRE 30 CREDIT PROGRAM:	\$19,500.00
OTHER PROGRAM RELATED FEES:	
Application	\$ 100.00
Textbooks	\$ 1500.00
Instructional/Lab Supplies	\$ 250.00
ESTIMATED TOTAL COST OF PROGRAM:	<b><u>\$21,350.00</u></b>

## DOCTOR OF PHILOSOPHY IN BIOMEDICAL ENGINEERING PROGRAM

TUITION PER CREDIT:	\$ 650.00
FULL TIME STUDENT TUITION:	
SEMESTER I (9 credits):	\$ 5,850.00
SEMESTER II (9 credits):	\$ 5,850.00
DISSERTATION RESEARCH (12 credits):	\$ 7800.00
TUITION COST OF ENTIRE 30 CREDIT PROGRAM:	\$19,500.00
OTHER PROGRAM RELATED FEES:	
Application	\$ 100.00
Textbooks	\$ 1500.00
Instructional/Lab Supplies	\$ 250.00
ESTIMATED TOTAL COST OF PROGRAM:	<b><u>\$21,350.00</u></b>

A student who has not paid the tuition bill by the close of the course will not be allowed to register for additional courses and credit for courses will be withheld.

Transcripts will not be issued to students with delinquent accounts.

Note: There is no differential between the costs of domestic (in-state, out-of-state) and international students. Students may wish to budget approximately \$20.00 to \$60.00 per week for leisure expenses.

All fees are subject to change at any time.

### 4.2 FEE PAYMENT

Tuition, room and board and all other fees incurred at University of Northern California are due in full on the first day of each semi-term. Fees are due on the first day of each course lasting more than one semi-term.

### 4.3 EXTENDED PAYMENT PLAN

A semi-term payment plan allows for the division of expenses into three payments, each due on the first day of each six-week semi-term. This provides for six equal payments to be made during the nine-month school year. This payment plan is available only to students enrolled full-time.

## 5. CANCELLATION AND REFUND POLICIES

### 5.1. REFUND POLICY

The University of Northern California utilizes the State of California's refund policy. The student has the right to a full refund of all charges less the \$100.00 registration fee if he/she cancels the enrollment agreement before midnight of the eighth business day of the program's first semester and has made an initial payment.

Cancellation and withdrawal request must be in writing addressed to the UNC Registrar. Students canceling after the eight day of the instructions are eligible for a pro rata refund of all fees paid for which instruction was not delivered, if the student has completed 60% or less of the instructions. If the student has completed 60% or more of the instructions the student is not eligible for a refund.

The refund shall be the amount the student has paid for the instruction multiplied by a fraction, the numerator of which is the number of hours of instruction not received but for which the student has paid, and the denominator of which is the total number of hours of instruction for which the student has paid. The refund will be made within 30 days of the effective withdrawal date, as explained above.

The university will also refund money collected for sending to a third party on the student's behalf, such as for a license or application fee. If the school cancels or discontinues a course or educational program, the university will make a full refund of all charges.

Refunds will be paid within 30 days of cancellation or withdrawal.

Students obtaining a loan will be responsible to repay the full amount of the loan plus interest, less any refund.

### 5.2. TUITION REFUND FORMULA

The following formula will be used to determine the amount of refund granted when a student withdraws from a course after having received 60% or less of the instruction:

$$\text{amount paid for instruction} \times \frac{\text{clock hours of instruction paid for but not received}}{\text{clock hours of instruction paid for by student}} = \text{refund amount}$$

For example, if the student completes only 30 hours of a 60-hour course and paid \$625.00 tuition, the student would receive a refund of \$312.50.

$$\begin{array}{r} \$625.00 \\ \text{(amount paid} \\ \text{for instruction for} \\ \text{which the student has} \\ \text{paid)} \end{array} \times \frac{\begin{array}{r} 30 \text{ (clock hours of instruction paid} \\ \text{for but not received)} \end{array}}{\begin{array}{r} 60 \text{ (clock hours of instruction)} \end{array}} = \begin{array}{r} \$312.50 \\ \text{(refund amount)} \end{array}$$

### **5.3. STUDENT TUITION RECOVERY FUND**

The Student Tuition Recovery Fund (STRF) was established by the California Legislature to protect any California resident who attends a private postsecondary institution from losing money if the California student prepaid tuition and suffered a financial loss as a result of the school closing, failing to live up to its enrollment agreement, or refusing to pay a court judgment.

You must pay the state-imposed assessment for the Student Tuition Recovery Fund (STRF) if all of the following applies to you:

1. You are a student, who is a California resident, or are enrolled in a residency program, and prepay all or part of your tuition either by cash, guaranteed student loans, or personal loans, and
2. Your total charges are not paid by any third-party payer such as an employer, government program or other payer unless you have a separate agreement to repay the third party.

You are not eligible for protection from the STRF and you are not required to pay the STRF assessment, if either of the following applies:

1. You are not a California resident or enrolled in a residency program, or
2. Your total charges are paid by a third party, such as an employer, government program or other payer, and you have no separate agreement to repay the third party.

The State of California created the Student Tuition Recovery Fund (STRF) to relieve or mitigate economic losses suffered students who are California residents, or are enrolled in a residency program attending certain schools regulated by the Bureau for Private Postsecondary Education.

You may be eligible for STRF if you are a California resident or are enrolled in a residency program, prepaid tuition, paid the STRF assessment fee, and suffered an economic loss as a result of any of the following:

1. The school closed before the course of instruction was completed.
2. The school's failure to pay refunds or charges on behalf of a student to a third party for license fees or any other purpose, or to provide equipment or materials for which a charge was collected within 180 days before the closure of the school.
3. The school's failure to pay or reimburse loan proceeds under a federally guaranteed student loan program as required by law or to pay or reimburse proceeds received by the school prior to closure in excess of tuition and other costs.
4. There was a material failure to comply with the Act or this Division within 30 days before the school closed or, if the material failure began earlier than 30 days prior to closure, the period determined by the Bureau.
5. An inability after diligent efforts to prosecute, prove and collect on a judgment against the institution for a violation of the Act.

No claim can be paid to any student without a social security number or a taxpayer identification number.

## **6. STUDENT SERVICES**

### **6.1. ACADEMIC ADVISEMENT**

Prior to each student's arrival at UNC, he/she is assigned a faculty adviser. The faculty adviser counsels the student with regard to the student's academic program helps the student plan a course of study and discusses with the student any other issues related to the University. Students are encouraged to utilize the services of their adviser. Faculty, in their classes and through advising, will encourage students to form study groups.

### **6.2. CAREER PLANNING AND PLACEMENT**

Career planning and placement, coordinated through the Office of the Dean of Students, is part of the academic advising function of the faculty. The individual faculty adviser assists the student in the assessment of his or her potentials for placement. The Office of the Dean of Students arranges such services as C.V./resume workshops, employer visits to the campus and interviews with students.

### **6.3. STUDENT HEALTH AND SAFETY**

On campus first aid supplies for general health care needs are provided at the general business office. The office also provides students with health insurance information and information about local clinics and private health care providers within the +Rohnert Park area.

### **6.4. ACADEMIC ACHIEVEMENT AND RECOGNITION**

The establishment of student scholarships, prizes and other awards for outstanding academic achievement is the priority program of the University of Northern California Foundation. The Chief Academic Officer will review all such official programs of recognition for appropriateness and financial sufficiency, before being presented to the faculty for approval. Members of the faculty periodically recommend students for honors and other recognitions of academic achievement.

### **6.5. STUDENT AND ALUMNI ORGANIZATIONS**

UNC Alumni Association  
Wei CHENG, President  
2292 Faraday Ave.  
Carlsbad, CA 92008  
Telephone: (706) 603-3807  
e-mail: wcheng@isisph.com

Students are encouraged to develop on-campus student organizations.

## **7. POLICIES**

### **7.1. ACADEMIC PERFORMANCE AND RECORDS**

#### **7.1.1. ATTENDANCE, DROPOUT AND LEAVE-OF-ABSENCE POLICIES**

##### ATTENDANCE

Instructors will keep records of each student's attendance. Students are expected to attend all scheduled activities in every course in which they are enrolled. Instructors may excuse a student from no more than 10% of the scheduled activities in a course. Students who are absent from more than 10% of a course must have the approval of the Dean of Students before they are eligible for credit for the course.

##### DROPOUT AND LEAVE OF ABSENCE

Students wishing to take a leave of absence with the intent of returning may do so by writing a letter of intent to the Dean of Students. This letter should include reasons for withdrawal and plans for returning.

Students who withdraw from school without giving notice to the Dean of Students will be removed from the roster of active students and will be required to reapply for entry into their program. Refunds for such students will be calculated based on the last date of actual attendance. For information regarding the refund schedule, see the Enrollment Agreement at the back of this catalog or 'Tuition Refunds,' above.

A student may withdraw from a course no later than the end of the 11th week of the semester and receive a grade of W. After this date, a student who withdraws from a course normally will receive a grade of F.

#### **7.1.2. GRADES**

Grades (and grade points) in courses are A=4.0, B=3.0, C=2.0, D=1.0, and F=0.0. Instructors, at their individual discretion, may refine these grades by indicating + (+ = 0.3) or - (- = 0.3). However, in order to maintain the 4.0 rating scale, the highest GPA a student may receive is 4.0, such that there is no 'A+'.

Each student's level of achievement is evaluated according to the following grade scale:

A or A-	Excellent
B+, B, or B-	Above Average
C+, C, or C-	Good
D+, D+ or D	Below Average
F	Unsatisfactory
I	Incomplete

The grades of F and I do not yield credit. An F grade is considered in computing a student's grade point average, an I grade is not. The grade of I may be given only if the student submits a Petition for Grade of Incomplete form to the instructor that has already been authorized by the Department Chair; it must be approved by the instructor and submitted to the Registrar prior to the end of the given term. The work must be made up in accordance with the specifications outlined on the Petition form, within the first six weeks of the following semester, quarter or semi-term. Failure to do so will result in a final course grade of F.

## PROBATION AND DISMISSAL

A student who consistently performs below average (< C) may be referred to the Chief Academic Officer. A student whose cumulative grade point average (GPA) is below 2.0 may be subject to suspension. A student re-admitted after academic suspension, whose cumulative academic average (calculated from the date of re-admission) falls below 2.0 may be subject to dismissal. A graduate student who consistently performs below average (GPA < B) may be referred to the Dean of Students. A graduate student whose cumulative grade point average is below 3.0 may be subject to suspension. A graduate student re-admitted after academic suspension, whose cumulative academic average (calculated from the date of re-admission) falls below 3.0 may be subject to dismissal.

## STUDENT CONDUCT

Students are expected to maintain acceptable standards of personal conduct. Failure to do so will be grounds for dismissal.

### **7.1.3. RETENTION OF STUDENT RECORDS**

Students' admission records are kept in the Office of Admissions. Once a student has matriculated, the Office of the Registrar will maintain academic files. All transfer credits, credits awarded by examination, for completion of research projects, for theses and dissertations, and related achievements are maintained in the Office of the Registrar.

The University of Northern California keeps permanent records of students, courses, and degrees awarded for a period of five years. Duplicate computer records are retained permanently. Both paper and computer records are kept in the Registrar's Office.

Students may order official transcripts by contacting the Office of the Registrar. A \$10 fee is charged for the first transcript. Additional transcripts requested thereafter are \$5 each.

### **7.1.4. STUDENT RECORDS AND RELEASE OF INFORMATION**

Student records are supervised by the Registrar and access is afforded by school officials for purposes of recording grades, attendance, advising, audits, and accrediting reviews, as well as determining tuition and eligibility.

### 7.1.5. CHANGE OF STATUS

Students are required to notify the Registrar when a change in status occurs, i.e., change in address, e-mail address, phone number, name, attendance, eligibility, or any other change that may have an impact upon completion of the student's education.

## 7.2. RIGHTS AND CONDUCT

### 7.2.1. ACADEMIC FREEDOM

UNC is strongly committed to academic freedom and free speech, and endorses in principle the 1940 Statement of Principles of Academic Freedom set forth by the American Association of University Professors and the Association of American Colleges. Academic freedoms are the right of every UNC faculty member. These freedoms include:

- **Freedom to teach and discuss a field of competence without restrictions on instructional method.**

In the exercise of this freedom, the faculty member should be careful not to introduce controversial matters that have no relation to the subject matter of the course. The faculty member is also obligated to encourage the free pursuit of learning by students. The faculty member adheres to a proper role as intellectual guide and counselor. Every reasonable effort is made to foster honest academic conduct and to assure that evaluation of students reflects the true merit of their work. The confidential nature of the relationship between faculty member and student is respected.

- **Freedom as a private citizen to speak out on public issues.**

The special position of the faculty member as a person of learning and an educational officer in the community, however, imposes the special obligation that he or she must remember that the public may judge the profession and the institution on the basis of such public utterances. The faculty member measures all rights and obligations as a citizen against rights and responsibilities to the field of specialization, to students, profession, and institution. When speaking, writing, or acting as a private person, the faculty member avoids creating the impression that he or she is speaking for UNC.

### 7.2.2. STUDENT RIGHTS

It is the policy of University of Northern California that each student be guaranteed the following rights and freedoms:

- The right to participate in any and all university-sponsored activities and services without regard to the student's race, creed, color, gender, sexual orientation, nationality, or age.
- The right to obtain a list of basic rights.
- The right to be evaluated in the classroom solely on the basis of academic ability, achievement and fulfillment of the requirements of the class.
- The right to be represented in a democratic student government.
- The right to organize for the purpose of promoting common interests.
- The right to participate in the formulation and implementation of academic and non-academic policy.

- The right to petition for changes in academic or non-academic policies and procedures.
- The right to due process in any action brought or taken by the University against the student that can reasonably be expected to affect the student's status with the University.
- The right to restrict the release of information taken from the student's academic records as stated in Section 438 of the Family Educational Rights and Privacy Act of 1974.

### **7.2.3. PRINCIPLES OF ETHICAL CONDUCT**

Inherent within the responsibility for educating the future leaders of our society is the obligation to adhere to the highest ethical standards and principles. UNC is committed to maintaining the highest standards of ethics and integrity in all of its academic and administrative operations.

- Members of the university community are expected to exercise and demonstrate personal and professional honesty and to respect the rights, values and contributions of others.
- Members of the university community are expected to be aware of and comply with relevant laws, regulations, contract requirements and university policies and procedures.
- Individuals with access to confidential, proprietary or private information must never use or disclose such information except where authorized or legally obligated to do so.
- All members of the university community are responsible for avoiding, where possible, real or potential conflicts of interest and commitment between personal and professional responsibilities, including relationships that have the appearance of a conflict.
- The university's interests should be foremost in all official decision making and employees and others acting on behalf of the university shall remove themselves from decision-making roles that involve them in any personal capacity or which involve their friends or family members.
- All individuals acting on behalf of the university have a responsibility to ensure that funds and other assets received are used in an ethical manner. Assets of the university (including personnel), whether tangible or intangible, may not be used for illegal purposes or personal gain.
- Members of the university community shall strive to present all information, including financial information and research data and results, completely and accurately.

Members of the university community are expected to comply with these principles. Failure to do so may be grounds for dismissal.

### **7.2.4. POLICY CONCERNING PLAGIARISM**

UNC requires academic honesty. All work submitted by a student must represent her or his own original words or ideas. In cases where a student chooses to use the words or ideas of another person, then the student is required to cite all relevant sources, and the extent to which such sources were used. Words or ideas that require citation include, but are not limited to, all hard copy or electronic publications, whether copyrighted or not, and all verbal or visual communication when the content of such communication clearly originates from an identifiable source.

### **7.2.5. REGULATIONS REGARDING HARASSMENT AND SEXUAL HARASSMENT**

UNC is committed to maintaining an environment that recognizes the inherent worth and dignity of every person. Critical to UNC's mission is providing a nondiscriminatory environment that is conducive to learning. Therefore, all forms of harassment are antithetical to UNC's goals and counter to UNC's commitment to fostering a community based on tolerance, sensitivity, understanding, and mutual respect.

UNC is committed to providing all employees and students a workplace free of harassment and will not tolerate sexual harassment in any form. Prohibited harassment includes anyone (male or female) making unwelcome sexual advances, requesting sexual favors, or engaging in other written, verbal or physical conduct of a sexual nature. Some examples of the forms sexual harassment may take include sexually suggestive or derogatory comments, jokes or innuendoes about sex, crude pranks, sexual advances or propositions, leering, whistling, obscene gestures, displaying sexually explicit or pornographic material, unwelcome touching, physical assault, or disparate treatment based on gender.

Any student who believes he or she has been the subject of sexual harassment in school should immediately report the incident to an instructor or any UNC employee. The report will then be immediately forwarded to the school's sexual harassment investigator. All reports of sexual harassment will be investigated promptly, impartially, and as confidentially as possible under the direction of the school's sexual harassment investigator. Appropriate corrective action will be taken to remedy all violations of this policy. Under no circumstances will the reporting student be subject to retaliation.

Any person associated with UNC who is found to have harassed a fellow student or employee will be subject to severe disciplinary action including possible discharge or withdrawal. UNC will also take any additional action necessary to appropriately remedy the situation.

The individual who makes unwelcome advances, threatens, or in any way harasses another student or employee is personally liable for such actions and their consequences. UNC will not provide legal, financial or any other assistance to an individual accused of harassment if a legal complaint is filed.

### **7.2.6. POLICY ON STUDENT COMPLAINTS AND GRIEVANCES**

This policy applies to complaints regarding fellow students, staff and faculty. It is suggested that the student pursue the following progression for the resolution of a complaint:

1. Attempt to resolve the issue with the party in question.
2. Seek the advice of the Program Coordinator and/or Department Chair.

At the point where the student has exhausted all of the previous avenues for resolution of the conflict, the Chief Academic Officer (CAO) should be apprised of the situation in writing. If unable to resolve the matter, the CAO will convene a hearing composed of the CAO, a faculty member, a student member. The parties involved in the dispute will present their cases at the hearing. The decision of the hearing will be final resolution of the grievance.

A student or any member of the public may file a complaint about this institution with the Bureau of Private Postsecondary Education by calling (888) 370-7589 toll-free or by completing a complaint form, which can be obtained on the bureau's Internet web site [www.bppe.ca.gov](http://www.bppe.ca.gov).

#### **7.2.7. ADA AND DISABILITY POLICY**

UNC does not discriminate on the basis of disability in the educational programs or activities, which it conducts in accordance with Sections 503 and 504 of the Rehabilitation Act of 1973, as amended. It does provide reasonable ADA accommodations in accordance with U.S.C. 12101, Et. Seq. and EEOC Bulletin 915.002.

If you are an individual with a disability who may require assistance or accommodation in order to participate in or receive benefit from a UNC educational program, or if you desire more information, please contact the Office of Administration at UNC.

#### **7.2.8. NONDISCRIMINATION POLICY**

UNC does not discriminate on the basis of age, parental status, marital status, sexual preference, disability, race, color, or national origin in admissions and/or employment in its programs and activities, which it conducts in accordance with Title VI of the Civil Rights Act of 1964, as amended. In addition, UNC does not discriminate on the basis of gender in the educational programs or activities which it conducts in accordance with Title IX of the Education Amendments of 1972, as amended. Moreover, UNC is committed to maintaining a working and learning environment, which is free from racial harassment. No person shall, on the basis of gender, sexual orientation, age, creed, marital status, disability, race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination or be subjected to sexual harassment in any programs or activities.

The President is the campus officer assigned responsibility for ensuring compliance with federal, state, and UNC regulations prohibiting discrimination on the basis of gender, disability, sexual preference, marital status, age, parental status, race, color, or national origin and for ensuring a working and learning environment which is free from sexual harassment and racial discrimination.

#### **7.2.9. EQUAL OPPORTUNITY**

All members of the UNC community will be provided equal opportunities for equal accomplishment and ability. UNC encourages diversity and appreciates the special attributes of each individual.

## **8. FACULTY**

### **BIOMEDICAL ENGINEERING FACULTY**

#### Department Chair

Y. King Liu, PhD  
Wayne State University, PhD-1963  
Engineering Mechanics

Benny Chan, PhD  
University of Northern California, PhD-2013  
Biomedical Engineering  
Stanford, MS-1985  
Material Sciences

Tejesh Patel, MS, ABD  
University of Northern California, ABD-2015  
Biomedical Engineering  
Lawrence Technical University, MS-2009  
Mechanical Engineering

Sudeep Rao, PhD  
University of New Mexico, PhD 1998  
Engineering  
University of New Mexico, MS-1992  
Chemical Engineering

Allison Washburn, PhD  
John Hopkins, PhD-1992  
Psychology

## **9. UNIVERSITY OF NORTHERN CALIFORNIA GOVERNANCE**

### **UNC PRESIDENT**

Y. King Liu, PhD

### **UNC BOARD OF DIRECTORS:**

Emmit George, JD, Interim Chairman of the Board

Paul Dunn, PhD, member

Howard Leonhardt, DEng(hc), member