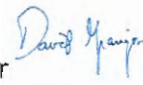


March 9, 2018

Memorandum of Understanding

To: David Kieda, Dean, The Graduate School

From: David W. Grainger, Ph.D., Distinguished Professor and Chair



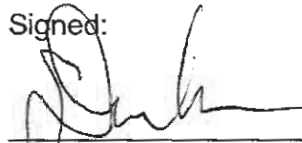
Dean Kieda:

I write at the request of the Senate Executive Committee to clarify language on my recent formal request to change the name of the Department of Bioengineering to the Department of Biomedical Engineering. Graduate Council approved this request earlier this month.

Academic Senate's Executive Committee's position was that my request was not entirely clear in coupling the desired name change of the Department with the associated additional two requests to change the names of both of our department's graduate degrees also to the same name (i.e., MS. in Biomedical Engineering; Ph.D. in Biomedical Engineering).

Please sign below to indicate your understanding that this tripartite common name change approval is in fact what Graduate Council approved and what the Graduate School also believes in proposed in my request. Thank you!

Signed:



David Kieda, Ph.D.
Dean, The Graduate School

Date:

03/12/18

Council Approval

Note: This form is intended to track the progress of a proposal (whether from Academic Affairs or Health Sciences) through the Undergraduate and Graduate Councils.

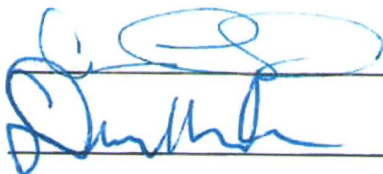
Proposal: Name Change from Department of Bioengineering to
Department of Biomedical Engineering with MS & PhD

This proposal needs to go through:

Undergraduate Council	☐
Graduate Council	☐
Both Approvals	☒
Grad Approval/Undergrad Notification	☐

This proposal has been approved by:

Chair of Undergraduate Council



Date: 2-16-18

Chair of Graduate Council



Date: 2-1-18

Once the appropriate signature(s) have been obtained, please forward this completed form to the Office of the Senior Vice President for Academic Affairs. *(NOTE: The SVP-AA is the Chief Academic Officer for the University of Utah and reports to the Board of Regents in this capacity. When necessary, the CAO will get a signature from the SVP-HSC.)*

Chief Academic Officer



Date: 3-7-18

Once the Chief Academic Officer's signature has been obtained, this approval document will be forwarded to the **Office of the Academic Senate**.

Utah System of Higher Education
Changes to Existing Academic Program Proposal
Cover/Signature Page - Abbreviated Template

Institution Submitting Request:	University of Utah	
Program Title:	<i>Current</i> Bioengineering	<i>Proposed (if applicable)</i> Biomedical Engineering
Sponsoring School, College, or Division:	College of Engineering	
Sponsoring Academic Department(s) or Unit(s):	Bioengineering	Biomedical Engineering
Classification of Instruction Program Code ¹ :	14.0501	14.0501
Min/Max Credit Hours for Full Program Required:	90 / 120	90 / 120
Proposed Effective Term for Program Change ² :	Summer	2018

Institutional Board of Trustees' Approval Date:

Program Change Type (check all that apply):

☒	Name Change of Existing Program
☐	Program Consolidation
☐	Program Restructure
☐	Program Transfer to a new academic department or unit
☐	Program Suspension
☐	Program Discontinuation
☐	Reinstatement of Previously Suspended Program
☐	Out-of-Service Area Delivery Program

Chief Academic Officer (or Designee) Signature:

I, the Chief Academic Officer or Designee, certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

Please type your first and last name _____ Date: _____

☐ I understand that checking this box constitutes my legal signature.

¹ For CIP code classifications, please see <http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55>.

² "Proposed Effective Term" refers to term when change to program is published. For Suspensions and Discontinuations, "effective term" refers to the term the program will suspend admissions.

Program Change Description - Abbreviated Template

Section I: The Request

University of Utah requests approval to change name from Bioengineering to Biomedical Engineering effective Summer 2018. This action was approved by the institutional Board of Trustees on .

Section II: Program Proposal

Program Change Description/Rationale

Present a brief program change description. Describe the institutional procedures used to arrive at a decision for the change. Briefly indicate why such a change should be initiated. State how the institution and the USHE benefit by the change.

Name change to department and graduate M.S. and Ph.D. degrees are requested for the current Department of Bioengineering (University of Utah). The proposed new name is the "Department of Biomedical Engineering" and "Master of Science (M.S.) in Biomedical Engineering" and "Doctor of Philosophy (Ph.D.) in Biomedical Engineering", reflecting a tighter relationship and closer programmatic alignment with the only School of Medicine in the State of Utah, as well as more consistent description of the faculty expertise, research interests and programmatic offerings. The word "biomedical" captures the specific "medical" emphasis that the department desires in its relationship to University Health Sciences, and moves away from the former "bioengineering" branding that is more characteristic of very early, historic versions of the field when biotechnology, biophysics, bio-instrumentation and even bio-agricultural interests and education were major components. This former emphasis is distracting, no longer relevant and not a desirable feature of Utah's medically focused department. The requested name change to biomedical engineering allows University of Utah to promote this more medical focus with its flagship hospital, health sciences, School of Medicine and medical technologists, including prominent biomedical industry in the State. The State and USHE benefit by more accurate branding and marketing of diverse University education and training programs state-wide: at University of Utah, "biomedical engineering" aligns with its major biomedical and medical presence institutionally; other State universities (e.g., USU with its agricultural focus has already adopted "biological engineering") might better adopt the term bioengineering to reflect their broader, biological, biotechnological but not necessarily medical-associated engineering programming. The name change aligns with many national changes in this regard for universities whose biomedical engineering programs align with strong medical or medical school presence and co-education and mentoring.

Faculty consultation: The executive committee of the faculty was convened to discuss this name change. After much discussion, the faculty voted unanimously (15 in favor; none against; 6 non-voting, absent) in favor of the motion to change the name of the Department from Department of Bioengineering to Department of Biomedical Engineering on October 27, 2017.

66% by 2020: The biomedical engineering bachelors (B.S.) degree is the highest demand, most competitive major on the campus. The name change is responsive to the Governor's Education Excellence Commission Proposal 5 on Mission-based funding: State Engineering initiative funding has permitted us to expand our B.S. educational program quality and student enrollment. Most of these students move into local industry or professional programs. Substantial Federal research funding to the Department provides on-going training support for our expanding Masters and Ph.D. programs in bioengineering, and our top-30 academic program ranking nationally. We address Proposal 6 Internal Alignments by having our department name better reflect our increasing internal alignment and partnering with our Health Sciences programming and our School of Medicine colleagues who mentor our students and teach in in our programs. We address Proposal 7 External Alignments by aligning with the national trend to name our competitor departments also as "Biomedical Engineering", and to better reflect our mission to train people for local industries largely focused on medical devices and medical technologies (as opposed to biotechnology, pharma, or agriculture). We better align with the USTAR missions for "to leverage science and technology innovation to expand and diversify the State's economy" by focusing on biomedical engineering with our healthcare partners on campus and

statewide.

Learning Outcomes and Assessment: See attached

Consistency with Institutional Mission/Institutional Impact

Explain how the action is consistent with the institution's Regent-approved mission, roles, and goals. Institutional mission and roles may be found at higheredutah.org/policies/policyr312/ . Indicate if the program will be delivered outside of designated service area; provide justification. Service areas are defined in higheredutah.org/policies/policyr315/ . Will faculty or staff structures be impacted by the proposed change?

Per the State of Utah's Higher Education documentation, R312, Configuration of the Utah System of Higher Education and Institutional Missions and Roles, Section 4.1.1: "The University of Utah fosters student success by preparing students from diverse backgrounds for lives of impact as leaders and citizens. We generate and share new knowledge, discoveries, and innovations, and we engage local and global communities to promote education, health, and quality of life. These contributions, in addition to responsible stewardship of our intellectual, physical, and financial resources, ensure the long-term success and viability of the institution."

The proposed department name change from "Bioengineering" to "Biomedical Engineering" is completely consistent with the stated mission and goals for the University of Utah. In fact, the proposed change might be argued to correspond better to the 21st century vision for "education, health, and quality of life" since biomedical engineering education is thematically closer to impacting and improving (human) health and quality of life than bioengineering can be.

Suspension, Discontinuance, or Reinstatements ONLY

If suspending a program, indicate the statewide impact of this change. Explain the reason for suspension and the anticipated length of time for the suspension.

If discontinuing the program, indicate the statewide impact of this change. Explain how currently admitted students may complete the program within a reasonable period of time compatible with accreditation standards either through either (1) enrollment of students at other institutions of higher education; or (2) courses being taught for a maximum of two years after discontinuation of the program or until no admitted students remain who are entitled to complete the program, whichever comes first.

If reinstating a program, indicate the statewide impact of this change. Explain the reason for reestablishing the program and explain any changes being made to original program.

Finances

What costs or savings are anticipated from this change? If new funds are required to implement the change, indicate expected sources of funds. Describe any budgetary impact on other programs or units within the institution.

No changes anticipated.



Richard B. Brown

Dean of Engineering
1692 Warnock Engineering Building
72 S. Central Campus Drive
Salt Lake City, Utah 84112
PH: (801) 585-7498 FAX: (801) 581-8692
brown@utah.edu
<http://www.coe.utah.edu/~brown>

February 1, 2018

Board of Trustees
The University of Utah
Salt Lake City, Utah 84112

Dear Board Members:

The University of Utah established the Bioengineering Department in 1974 when the Department of Biophysics and Bioengineering split into two departments, with Biophysics moving into the College of Medicine and Bioengineering being in the College of Engineering. The early faculty in Bioengineering made seminal contributions to the areas of artificial organs, brain-computer interfaces, and other research areas. The Department has a great reputation. The faculty of our Bioengineering Department would now like to change the name of their department and graduate degrees to "Biomedical Engineering."

The primary justification for this is two-fold, as I understand it. First of all, terminology has changed since the founding of our department. Many departments with education and research foci similar to those of our faculty are now called biomedical engineering. Secondly, the name "biomedical engineering" makes it clear that the focus of our department is on bioengineering that is closely related to medicine. This accurately represents the current faculty and emphasizes the close relationship between our department and the U's excellent School of Medicine.

I support this name change. The undergraduate degree is already named "Biomedical Engineering." With this department name change, the masters and Ph.D. degree names will also be changed to "Biomedical Engineering." Having the same name for all of the degrees offered by the department appeals to me.

I encourage you to support this change requested by our faculty.

Sincerely,

Richard B. Brown
Dean of Engineering

October 27, 2017

State of Utah
Higher Education Board

Re: requested Department name change to Biomedical Engineering

To whom it may concern:

As Department Chair, I write in support of our recent faculty initiative to change the name of our Department of Bioengineering at the University of Utah to the *Department of Biomedical Engineering*. The Department has held this name since its inception in 1974. At that time, the name "bioengineering" meant much different things than it does now. Additionally, our department's education, training and mentoring focus with biomedical topics, medicine as a discipline, medical technology and medical partners in our prominent School of Medicine decades ago cannot compare to our current medical relationships. Hence, the move to the "Biomedical Engineering" name is currently much more appropriate as well as nationally competitive and consistent with predominantly medically oriented engineering departments. My faculty feel that this name change is important to identifying our mission and discipline, and branding our department on an international stage with other so-named departments.

I attempt to document the complete rationale and upside of this naming change in the proposal that accompanies this letter. I hope you might agree that this department name change and the changing of two graduate degrees in our program to the same name is enhancing to our image, our mission with our medical colleagues on and off campus, and our identity with our peer departments around the country.

I appreciate your consideration of this timely request.

Sincerely,



David W. Grainger, Ph.D.
Distinguished Professor and Chair

- **B.S. in Biomedical Engineering (existing, approved, unchanged)**

Program Purpose

The biomedical engineering undergraduate program is dedicated to preparing graduates for professional careers. Our graduates are educated to be: - successful in graduate programs, in professional schools, including medicine and law, or in a biomedical engineering aligned career; - able to effectively communicate and solve problems at the interface of engineering and biology appropriate to their chosen profession, as well as understand and apply standards of ethical behavior; - motivated to pursue life-long learning, including understanding contemporary questions at the interface of science, medicine, technology, and society.

Learning Outcomes

- o **Undergraduate Engineering Program Outcomes (ABET A-K)**

an ability to apply knowledge of mathematics, science, and engineering

an ability to design and conduct experiments, as well as to analyze and interpret data

an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

an ability to function on multidisciplinary teams

an ability to identify, formulate, and solve engineering problems

an understanding of professional and ethical responsibility

an ability to communicate effectively in an oral format

an ability to communicate effectively in a written format

the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

a recognition of the need for, and an ability to engage in life-long learning

a knowledge of contemporary issues

an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

BME Specific Program Outcomes

- an understanding of biology
- an understanding of physiology
- an ability to make measurements and interpret data from living systems
- an ability to address problems associated with the interaction between living and nonliving materials and systems
- a capability to solve the problems at the interface of engineering and biology by applying ADVANCED MATH including differential equations
- a capability to solve the problems at the interface of engineering and biology by applying STATISTICS
- a capability to solve the problems at the interface of engineering and biology by applying SCIENCE (hypothesis driven research)
- a capability to solve the problems at the interface of engineering and biology by applying ENGINEERING (design and analysis)

Program Assessment

- o Portfolio Review - Every few years
- o Student Research/Presentations - At least once a year
- o Capstone Experience/Project - At least once a year
- o Exit Survey/Placement Rates - At least once a year
- o Alumni Survey - Every few years
- o Other - At least once a year
 - Exit Interview

- **M.S. in Bioengineering (proposed to change to Biomedical Engineering)**

Program Purpose

Prepare students for success/leadership in industry and in preparation for future study in medicine, science and engineering.

Learning Outcomes

- o Demonstrate breadth of knowledge in bioengineering by successful completion of core courses in bioengineering.
- o Demonstrate competence within a well-defined area of bioengineering specialization through successful completion of specialized graduate courses.
- o Develop moderate depth of knowledge within a bioengineering specialization by successful defense of an M.S. thesis and/or completion of additional courses within a specialization.

Assessment

- o Student Research/Presentations - At least once a year
 - o Capstone Experience/Project - Every other year
 - o Exit Survey/Placement Rates - At least once a year
 - o Alumni Survey - Every few years
 - o Other - Every few years
 - Each MS Thesis Option student is required to write a thesis, submit it to his/her MS Supervisory Committee and defend it. Public MS defense is followed by a comprehensive exam in a close session with MS Supervisory Committee. MS Course Option students only need to pass the Comprehensive Exam.
-

- **Ph.D. in Bioengineering (proposed to change to Biomedical Engineering)**

Program Purpose

Educate world-class Ph.D. scientists and engineers for accomplishment in research, academics, medicine, and/or industry.

Learning Outcomes

- o Students must meet the requirements specified by the University of Utah Graduate School and the College of Engineering.
- o Complete independent research and advance the state of knowledge in the field. Completion of the research requirement is demonstrated by publishing three (or more) peer-reviewed publications as first author, as approved by the research supervisory committee.
- o Demonstrate the ability to perform effective research: be well versed in the fundamentals, have cogent familiarity with the primary literature, and demonstrate an ability to design, communicate and execute a scientific research plan.
- o Effectively apply the scientific method, demonstrate the significance of his/her contributions to the field, and professionally communicate the results in both written and oral form.

Assessment

- o Student Research/Presentations - At least once a year
- o Capstone Experience/Project - Every few years
- o Exit Survey/Placement Rates - At least once a year
- o Alumni Survey - Every few years
- o Other - Every few years
 - Each PhD student needs to pass both written and oral PhD Qualifying Exams. After that the student is required to write a dissertation, submit it to his/her PhD Supervisory Committee and defend it. Public PhD defense is followed by an exam in a close session with PhD Supervisory Committee.

Department of Biomedical Engineering Program Reviews:

University of Utah Undergraduate and Graduate Program reviews occur every 7 years: Graduate Council procedures in this regard also include any undergraduate programs as well and are detailed at: <http://gradschool.utah.edu/wp-content/uploads/2013/05/FINAL-2017-18-RED-BOOK.pdf>.

All undergraduate and graduate degree granting programs at the University are subject to regular review. This process is managed by the dean and associate dean of the Graduate School for three purposes: first, informing long-range planning on the stability and viability of programs; second, providing educational units (typically departments) with the opportunity to engage in self-study and program enhancement; and third, to provide data to state agencies for the purposes of accountability. Each program is reviewed on a seven-year cycle. The department/program is requested to: 1) prepare a self-study (see later section for format and description), 2) supply the Graduate School with names and contact information of at least 7 potential external reviewers and 3) supply the Graduate School with names and contact information of at least 7 potential internal reviewers. All review materials are then compiled into a final report submitted to the Graduate School and reviewed by an ad hoc committee from the Graduate Council. Recommendations are formulated, presented to the department/program and reviewed periodically in written updates to monitor progress and compliance with recommended changes. Recommendations that can be achieved within the resources of the University are incorporated into an action plan for improvement. The final review is conducted by internal and external review committee members and is reviewed and approved by the Graduate Council.