The following Motions and Documents were considered by the Board Learning, Research and Student Experience Committee during the Open Session of its March 15, 2023 meeting:

Agenda Title: **Proposed New Course-based Master of Science in Biomedical Engineering, Faculty of Engineering**

APPROVED MOTION: THAT the Board Learning, Research and Student Experience Committee, acting with delegated authority of the Board of Governors, and on the recommendation of General Faculties Council Programs Committee, approve the new Course-based Master of Science in Biomedical Engineering, for implementation upon final approval.

Final Recommended Item: 4b.

Item No. 4b

Governance Executive Summary
Action Item

Agenda Title	**Proposed New Course-based Master of Science in Biomedical Engineering, Faculty of Engineering**

Motion

THAT Board Learning, Research and Student Experience Committee, acting with delegated authority of the Board of Governors, and on the recommendation of General Faculties Council Programs Committee, approve the new Course-based Master of Science in Biomedical Engineering, for implementation upon final approval.

Item

Action Requested	X Approval ☐ Recommendation
Proposed by	Simaan Abourizk, Interim Dean, Faculty of Engineering
Presenter(s)	Verna Yiu, Interim Provost and Vice-President (Academic)

Details

Office of Administrative Responsibility	Provost and Vice-President (Academic)
The Purpose of the Proposal is (*please be specific*)	The proposal is before the committee because the department of BioMedical Engineering is proposing to implement a new Course-based Master of Science in Biomedical Engineering.
Executive Summary (*outline the specific item – and remember your audience*)	Currently, the Department of Biomedical Engineering offers two graduate programs: Thesis-based Master of Science (Biomedical Engineering) and Doctor of Philosophy (Biomedical Engineering). All other departments in the Faculty of Engineering also offer a course-based masters; however, this is currently not available in the Department of Biomedical Engineering. We are proposing to add a course-based master of science in Biomedical Engineering. The program objectives are: ● To prepare students for a career in the biomedical engineering industry and/or set students up for success on a pathway to a career in medicine or health-related field ● To equip students with the required knowledge, skills, methods, tools, experience and capability to contribute to the biomedical engineering field ● To equip students from a background in any engineering or related discipline with the required foundational knowledge in biology and medicine to become trained biomedical engineers The program learning outcomes will be for students to: 1. Gain foundational knowledge in biomedical engineering across areas such as biomechanics, biomaterials, bioinstrumentation, biomedical device design, and biomedical research methods 2. Gain foundational knowledge in anatomy and physiology within the context of biomedical engineering

	3. Obtain relevant knowledge about emerging technologies and techniques in the biomedical engineering field 4. Communicate effectively in a multidisciplinary field, both orally and in writing 5. Understand ethical and professional responsibilities involved with biomedical research and development including work with human and animal participants Risks and Opportunities Summary Risks: The risks in not pursuing the course-based delivery route are: program stagnation, limiting recruitment of targeted students, and limiting pathways for students to expand their knowledge in their chosen field. Opportunities: The course-based delivery route will prepare students for current and emerging workplace needs, and will ensure graduates are equipped with the innovative skills and knowledge to be relevant and successful in the industry. This delivery route also offers flexibility and further expands students' scope of knowledge and practice within the discipline.
Supplementary Notes and context	This proposal was considered by the GFC Programs Committee (PC) at its meeting of February 9, 2023. The full proposal, including calendar changes, courses, and letters of support, can be found in the motion summary for that meeting.

Engagement and Routing (Include meeting dates)

Consultation and Stakeholder Participation (parties who have seen the proposal and in what capacity) <For information on the protocol see the Governance Resources section Student Participation Protocol>	*Those who are actively **participating**:* ● Key stakeholders in the Department of Biomedical Engineering and Faculty of Engineering have been consulted and have actively provided input to the program, including the BME Department Chair (Rob Burrell), the Dean of Engineering (Simaan AbouRizk), the Vice Dean of Engineering (Ivan Fair), Academic Staff in the Department of Biomedical Engineering (Maral Aminpour, Marilee Stephens, Alan Wilman) ● Associate Deans in the Faculty of Engineering (Peter Schiavone and Pierre Mertiny) ● Dr. Joseph Bergman from the Department of Surgery (Faculty of Medicine & Dentistry) has actively provided input to the program and will contribute going forward ● Dr. Gary Faulkner from GRRIT is working on a partnership for internships and work-integrated learning through funding from PrairiesCan
	*Those who have been **consulted**:* ● Faculty members in other engineering departments with teaching and research interests in biomedical engineering (Hasan Uludag, Larry Unsworth, Andrew Martin, Hossein Rouhani, Dan Romanyk, Wylie Stroberg, Manisha Gupta, Samer Adeeb), members of the Faculty of Medicine and Dentistry (Joseph Bergman, Jacqueline Hebert), and Associate Deans in the Faculty of Engineering. ● Students have been consulted through a survey with 69 respondents (75% undergraduate students).

	● We have consulted with Lena Hoziama (Director of Engineering Connects) and Tracy Raivio (Associate Dean Education (CNAS)) as well as FGSR (Frances Plane) and the Provost Office (Carley Roth, Janice Causgrove Dunn, Suzanne French). Additionally, we consulted with SMART Network NSERC CREATE (Jacqueline Hebert), and GRRIT (Gary Faulkner, Geoff Gregson, Doug Hill, Jim Raso) ● We consulted with Jessica Vandenberghe from the Faculty of Engineering and Florence Glanfield (Vice Provost Indigenous Programming and Research)
	*Those who have been **informed**:* ● All engineering faculty members ● Engineering Career Center ● FoMD faculty members ● Undergraduate, graduate, and highschool students are being informed through a Biomedical Engineering Symposium to be held on Feb. 11th as an outreach event.
Approval Route (Governance) (including meeting dates)	● Engineering Faculty Graduate Planning Committee (GPC): November 2, 2022 ● Engineering Faculty Academic Planning Committee (APC): November 9, 2022 ● Faculty of Medicine and Dentistry Faculty Learning Committee (FLC): November 22, 2022 ● Faculty of Medicine and Dentistry Graduate Planning Committee (GPC): November 28, 2022 ● Faculty of Medicine and Dentistry Dean's Executive Committee: November 28, 2022 ● FGSR Graduate Program Support Team (GPST): November 28, 2022 ● Faculty of Engineering Executive Coordinating Committee (ECC): November 29, 2022 ● FGSR Policy Review Committee (PRC): January 19, 2023 ● FGSR Council: February 8, 2023 ● GFC Programs Committee: February 9, 2023 ● Board Learning, Research and Student Experience Committee: March 10, 2023

Strategic Alignment

Alignment with *For the Public Good*	Please note the Institutional Strategic Plan objective(s)/strategies the proposal supports. Strengthening our programs in biomedical engineering is in direct alignment with one of the University's signature areas of Precision Health. The program will help to address the following Institutional Strategic Plan Objectives: *O1. Build a diverse, inclusive community of exceptional undergraduate and graduate students from Edmonton, Alberta, Canada, and the world* *The proposed program will be unique in Alberta, will provide substantial value to students in an area of clear interest (as shown by our student survey), and will attract high-quality students from both locally and abroad.*

<table>
<tr><td></td><td colspan="2">O7. Increase graduate and undergraduate students' access to an participation in a broad range of curricular experiential learning opportunities that are well-integrated with program goals and enrich their academic experience.
The proposed program has work-integrated learning through the capstone project and extensive professional development opportunities that will provide substantial value to students.
O12. Build a portfolio of signature research and teaching areas where the University of Alberta is or will be recognized as a global leader
The biomedical engineering program aligns with the strategic priority area of precision health. Introduction of the proposed program will strengthen the profile of the biomedical engineering department and will bring together the worldclass researchers and teachers in biomedical engineering and related disciplines from across campus who are already excelling.
O14. Inspire, model, and support excellence in teaching and learning
The proposed program will bring new courses and bring together experts to deliver high-quality education
O16. Enhance, increase, and sustain reciprocal, mutually beneficial community relations, community engagement, and community-engaged research and scholarship that will extend the reach, effectiveness, benefit, and value of our university-community connections.
We will aim to engage different communities and build connections with stakeholders through our capstone projects. Biomedical engineering has the capacity to provide benefit to a wide variety of community partners. This will also provide excellent opportunities for our students to learn and to work directly with community stakeholders from many sectors.

O17. Facilitate, build, and support interdisciplinary, cross-faculty, and cross-unit engagement and collaboration.
The program is a truly interdisciplinary program with strong collaboration across faculties (and colleges), with particular connections between Engineering and Faculty of Medicine and Dentistry.</td></tr>
<tr><td>Alignment with Core Risk Area</td><td colspan="2">Please note below the specific institutional risk(s) this proposal is addressing.</td></tr>
<tr><td></td><td>☐Enrolment Management
☐Faculty and Staff
☐Funding and Resource Management
☐IT Services, Software and Hardware
☐Leadership and Change
☐Physical Infrastructure</td><td>☐Relationship with Stakeholders
☐Reputation
☐Research Enterprise
☐Safety
X Student Success</td></tr>
<tr><td>Legislative Compliance and jurisdiction</td><td colspan="2">Post-Secondary Learning Act
UofA Calendar
General Faculties Council
Faculty of Graduate Studies & Research
Faculty of Engineering Council
Department of Biomedical Engineering Council</td></tr>
</table>

Attachments:

1. 2022 BME New Program Proposal

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(lindsey.westover@ualberta.ca)