U-CAAC Review of New Program Proposal

This form provides committee-wide feedback on the following proposed program.

Undergraduate ☑ Graduate ☐ College: COM-T

Proposal Name: Major in Medical Device Development and Application

Proposer's Name and Email: Marvin Slepian < slepian@arizona.edu >

Reviewers: Diana Daly < didaly@arizona.edu >, Kelly Potter < kspotter@arizona.edu >, John Ehiri < jehiri@arizona.edu >

1. **Rationale.**
   Is the mission of the program well justified?

   The proposed degree program allows students to learn the basics of medical and health fields as well as gain an understanding of the business of medical devices, the creation, design and engineering of devices, as well as the legal/regulatory and communication and marketing components of medical devices. The proposed

2. **Academic Standards/Compliance.**
   Do the curriculum and student support provisions meet the academic and policy standards of the university?

   This degree program meets academic standards, has strong student support built in, and includes mapped learning outcomes. There are prerequisites that make the outcomes of this degree vary depending on course plans of study. Such differences should be emphasized in marketing. However, the emphasis areas do help clarify

3. **Overlaps.**
   Are there perceived duplications with other UArizona programs? Conversely, could shared interests and emphases lead to collaborative or synergistic programs with other parts of the university? (These could take the form of co-ownership, co-delivered courses, shared faculty, shared facilities, etc.)

   There are no perceived duplications. This degree program leverages a highly multidisciplinary academic program to provide the broad skill set relevant to medical device technologists and marketers.

4. **Viability.**
   Is the program likely to enroll enough students to meet UArizona benchmarks for productive programs? Is there plausible evidence to back up enrollment predictions and budget projections?

   The information in the market analysis and the collaboration with industrial partners, combined with the survey results, suggest that this degree program will enroll enough students to be a productive program.

5. **Other feedback/comments.**

   Emphasis 2 would benefit from the addition of more course options that are aligned with the student core-course curriculum.

6. **Approval or Revisions Requested.**

   Approved

THE UNIVERSITY OF ARIZONA

New Academic Program Workflow Form

General

Proposed Name: Med Device Development & App

Transaction Nbr: 00000000000224

Plan Type: Major

Academic Career: Undergraduate

Degree Offered: Bachelor of Science

Do you want to offer a minor? N

Anticipated 1st Admission Term: Sprg 2026

Details

Department(s):

MDTC

DEPTMNT ID	DEPARTMENT NAME	HOST
0702	Surgery	Y

Campus(es):

MAIN

LOCATION	DESCRIPTION
TUCSON	Tucson

Admission application terms for this plan: Spring: Y Summer: Y Fall: Y

Plan admission types:

Freshman: Y Transfer: Y Readmit: Y Graduate: N

Non Degree Certificate (UCRT only): N

Other (For Community Campus specifics): N

Plan Taxonomy: 51.1199, Health/Medical Preparatory Programs, Other.

Program Length Type: Program Length Value: 0.00

Report as NSC Program:

SULA Special Program:

Print Option:

Diploma: Y Medical Device Development and Application

Transcript: Y Medical Device Development and Application

Conditions for Admission/Declaration for this Major:

There are no additional admission/declaration of major requirements for this degree.

Requirements for Accreditation:

There is no specialized accreditation required for this degree program.

Program Comparisons

University Appropriateness

The BS in MDDA aligns with the University of Arizona strategic plan, specifically, Pillar II: Grand Challenges and aims to leverage 4th Industrial Revolution advancements and tackle critical problems at the edge of human endeavor. Students who complete this degree program can go on to confront pressing health and wellness challenges in our communities through interdisciplinary collaboration. Students will be prepared to bring wellbeing and the use of medical device technology to communities, improving health and quality of life. This degree has a strong focus on what it takes to become a health care provider, how to use medical information to create pathways for future medical care, medical science-based reasoning, healthcare management, medical technology, medical devices, medical supplies manufacturing, machine learning, medical/health informatics and environmental influences on health and medical care. Students educated in use of medical devices and the science of bio-medical data will be in high demand and can help to build a workforce capable of addressing grand challenges related to disease prevention and wellness.

Arizona University System

NBR	PROGRAM	DEGREE	#STDNTS	LOCATION	ACCRDT

Peer Comparison

All programs have a focus on understanding the function of medical devices. The MS degree from University of Minnesota and the BS degree from New Jersey Technical Institute share a focus on design, innovation and development with the proposed MDDA program. Target careers for the three programs share significant overlap with the proposed MDDA program. The truly unique aspect of

the proposed MDDA program is that it has a lower math requirement, requiring only College Algebra and statistics. The other programs require some form of Calculus. The MDDA program has some exposure to biomedical engineering and an additional focus on regulation, policy, physiology, and business. The only peer program that shares those additional subjects is the Master's degree from University of Minnesota.

Resources

Library

Acquisitions Needed:

Physical Facilities & Equipment

Existing Physical Facilities:

We will use existing COM-T physical facilities (classrooms and laboratories) and equipment for this program. The COM-T Comprehensive Education Core (CEC) will also support this program.

Additional Facilities Required & Anticipated:

N/A

Other Support

Other Support Currently Available:

We will use existing COM-T staff for this program. COM-T Comprehensive Education Core (CEC) will also support this program.

Other Support Needed over the Next Three Years:

N/A

Comments During Approval Process

7/10/2024 3:42 PM

MELANIECMADDEN

Comments
updating proposed name to remove degree type, abbreviating "Medical Device Technology Development" which exceeds system character limits

4/15/2025 4:10 PM

MELANIECMADDEN

Comments
Due to concerns from the academic program's subcommittee regarding the name of the degree, Dean Abecassis confirmed the degree name change is B.S in Medical Device

Comments
Development & Application (MDD&A).

THE UNIVERSITY OF ARIZONA

NEW ACADEMIC PROGRAM – MAJOR
Preliminary Proposal Form

I. **Program Details**
   a. **Name (and Degree Type) of Proposed Academic Program:** Bachelor of Science in Medical Device and Technology Development (CIP CODE – 51.1199, College of Medicine)
      i. Emphasis 1: Medical Technology – Device
      ii. Emphasis 2: Medical Technology – Biotech/Pharma
      iii. Emphasis 3: Medical Technology – Business and Marketing/Media
      iv. Emphasis 4: Medical Technology – Regulatory-Law-Government
      v. Emphasis 5: Basic and Clinical Medical Sciences
   b. **Academic Unit(s)/College(s):** Life Sciences, Engineering, Business, & Law
   c. **Campus/Location(s):** Main Campus
   d. **First Admission Term:** Fall 2025
   e. **Primary Contact and Email:** slepian@arizona.edu

II. **Executive Summary:**

- Medical Device, Pharma and Biotech are the core of diagnosis, therapy, and prevention of disease and vital for driving health for Arizonans and others around the world.
- A broad group of competencies is required to advance, steward, and grow the field of medical devices - beyond the pure engineering or chemical technical aspects, e.g. understanding the market, developing ergonomic design, being facile with regulation, understanding financing and interfacing in educating the public.
- The MDTD program is unique in that specifically encompasses all the skill sets – the conceptual, soft and verbal financial and legal skills, beyond the purely technical.
- This major will yield graduates that are "job ready" - with a pull existing in the market ready for such graduates to fill ranks in the corporate, government, and private sectors.

III. **Brief Program Description:**

The Bachelor of Science in Medical Device and Technology Development (MDTD) is a four-year degree program designed and delivered as a collaboration between clinicians, basic scientists, engineers, business and law, with focus on learning about the medicine and the medical device filed and related technologies, providing students with multiple avenues upon graduation. The program would allow students to learn the basics in the medical and health field while expanding into areas of interest that would include the business of medical devices, the creation, design and engineering of devices, as well as the legal/regulatory and communication and marketing components of medical devices. The program juxtaposes applied topics such as what it is to be an individual that helps develop medical devices; or goes into the marketing, sales or use of devices; or processes and work in the regulatory fields of medical devices; and/or goes onto professional degree programs that would allow one to utilize such devices in their health care field. The rapidly growing field of medical devices and the MDTD BS program would allow for hands-on experience through simulation and actual device use in addition to information delivered in the classroom setting.

IV. **Program Rationale:**

The BS in Medical Device and Technology Development is a multi-disciplinary degree program involving collaboration with UArizona programs in Life Sciences, Engineering, Business, and Law. The program provides a broad range of electives for in-depth study, including in medical sciences, emergency medicine, aging in medicine, medical ethics, biomedical engineering, bioinformatics, integrative medicine, and climate change as a factor in medical care. It also offers training in regulatory science, legal aspects of technology development and stewardship and business and financial aspects as well.

Faculty involved in design and oversight of the program are clinicians, medical scientists, engineers, business and law professionals who contribute significantly to their corresponding fields at UArizona. This faculty expertise ensures that the BS in MDTD is and will remain carefully tailored to meet the needs of students seeking entry into professional healthcare programs and/or careers in allied health. Guided by the aforementioned faculty, students in the BS in Medicine program will develop knowledge and clinical reasoning skills useful in understanding their own health as well as in counseling and caring for others. Students will learn the use of devices and related technologies – drugs, combinational products and biotech, as well as virtual/telemedicine as healthcare tools, medical content knowledge, and the hands-on skills using simulation and shadowing to prepare for the many and diverse health care jobs/careers available.

V. **Projected Enrollment for the First Three Years:**

Year 1	Year 2	Year 3
25	75	125

VI. **Evidence of Market Demand:**

There are multiple components of medical device translational pathways from product ideation to patient use including intellectual property (IP) creation, business planning, engineering, preclinical testing, clinical trials, and statistical analysis of benefits and risks, reimbursement, and integration into practice guidelines. The U.S. Food and Drug Administration (FDA) Center for Devices and Radiological Health (CDRH) plays a key regulatory role in the device development process. With a rapidly aging population, the shift toward delivering in-home healthcare, and the increasing prevalence of diabetes, hypertension, and other chronic diseases are key developments expected to boost medical device sales in the next decade. Simultaneously, technological advances are revolutionizing the medical device industry, not only increasing the number of connected, patient-centric medical devices going to market but also strengthening their role in healthcare. The global medical devices market totaled $489 billion in 2021 and may top $500 billion in 2022. One estimate forecasts the market expanding to $719 billion by 2029 — an annualized rate of 5.5% from 2022 to 2029.

For up-and-coming graduates looking to kickstart their MDTD careers to experienced health technology professionals eager for their next challenge, the medical device technology development industry offers an abundance of opportunities for candidates at all stages of their careers. In the USA alone, the industry is responsible for the creation of over 2 million jobs, and given the unstoppable growth of innovative health technologies, it is likely that the sector will continue creating employment opportunities for the foreseeable future.

With the demand for medical technology professionals far outpacing supply, now is a better time than ever for high-quality graduates to pursue careers in MDTD. As well as excellent job prospects, MDTD candidates can expect relatively high salaries, the possibility of rapid career

advancement, the chance to make a positive difference for global well-being, and a lifetime of interesting challenges and advancement opportunities.

Employers Struggling to Fill Drug and Medical Device Development Positions:

Hoffmann-La Roche, BioMarin Pharmaceutical Inc., Cardinal Health, Nanoshift LLC, Scimitar Inc., BlueAllele, Genentech, Foundation Patents, Innovate Biopharmaceuticals, Morgans Financial, Proctor & Gamble, IQVIA, Johnson and Johnson, Abbott

Most biological technicians/technologists struggle with the following concepts due to the lack of academic preparation in the following areas:

- Strategy, Reimbursement, and Proof of Concept
- Intellectual Property, Outcome Measures, Trials, and Indications
- Software, Target Selection and Drug Discovery, and Absorption, Distribution and Metabolism
- Diagnostics, Biomarkers, and Wearable Devices

Top 6 Medical Device Technology Development Jobs:

Since med tech is an umbrella term that covers a lot of job profiles, given below are some of the most notable med tech jobs that you can apply for:

- Medical Device Designer
- Healthcare Data Analyst
- Telemedicine Specialist
- Health IT Consultant
- Biomedical Engineer
- Clinical Informaticist

VII. **Similar Programs Offered at Arizona Public Universities:**

There is no program such as the one proposed herein at the University of Arizona or any other ABOR Universities. For that matter this is a unique undergraduate major in the U.S. This program is complementary and synergistic to majors at UArizona, such as Biomedical Engineering or the BS in Medicine, but distinct in its focus and coverage. These other programs are not focusing on the broad field of medical devices, biotech or pharma – specifically the related disciplines as to how to advance, translate, market operate regulate advertise, legislate or otherwise financially support these technologies. The other majors focus on the pure technical side and are math heavy, which this program is not. There is a real need for a non-math broad focused major where graduates will have ready jobs.

VIII. **Resources**

a. **Summarize new resources required to offer the program:**

No new faculty are needed to instantly begin and grow the program. All resources are in place.

IX. **Required Signatures** *(the following should be included in the notification memo to campus after ABOR approval):*

a. **Program Director/Main Proposer:**

i. **Signature:** Marvin J Slepian MD

ii. **Name and Title:** Marvin J Slepian MD
Regents' Professor – Medicine, Surgery, BME

iii. **Date:** 2/22/24

b. **Managing Unit/Department Head:**

i. **Signature:** _____

ii. **Name and Title:** Geoffrey Gurtner, MD Professor and Chair, Surgery Professor,Biomedical engineering

iii. **Date:** 2/22/24

c. **College Dean/Associate Dean:**

i. **Signature:** _____

ii. **Name and Title:** Michael M.I. Abecassis, MD, Dean, College of Medicine - Tucson

iii. **Date:** 2/22/24

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ADDITIONAL INFORMATION FORM

To be used once preliminary proposal has been approved.

I. MAJOR REQUIREMENTS–

UNDERGRADUATE

Total units required to complete the degree	120
Upper-division units required to complete the degree	42
Foundation courses	
Second language	Second Semester Proficiency
Math	Moderate Math Strand MATH 112
General education requirements	*General Education: (23 units)* UNIV 101 – General Education UNIV 301 – General Education Capstone e-Portfolio 3 courses/9 units - Building Connections 1 course/3units Exploring Perspectives - Artist 1 course/3units Exploring Perspectives - Humanist 1 course/3units Exploring Perspectives – Social Scientist 1 course/3units Exploring Perspectives – Natural Scientist
Pre-major? (Yes/No).	No
List any special requirements to declare or gain admission to this major	None
Major requirements	
Minimum # of units required in the major (units counting towards major units and major GPA)	49
Minimum # of upper-division units required in the major (upper division units counting towards major GPA)	32
Minimum # of residency units to be completed in the major	18
Required supporting coursework (courses that do not count towards major units and major GPA, but are required for the major).	*Statistics Requirement (3 units)* Choose one: MATH 163 Basic Statistics (3 units)

	MATH 263 Introduction to Statistics and Biostatistics (3 units) BME 376: Biomedical Statistics (3 units) *General Sciences: (28 units)* MCB 181R & L Introduction to Biology & Lab (4 units) ECOL 182R & L Introductory Biology II (4 units) CHEM 130 and 130L Chemistry for Allied & Public Health (4 units) OR CHEM 141 and 143/145 or CHEM 151 General Chem I (4 units) or CHEM 161 Honors Chem I (4 units); PHYS 102/181 Physics I and Lab (4 units); PHYS 103/182 Physics II and Lab (4 units); PSIO 201 Human Anatomy and Physiology I and Lab (4 units); PSIO 202 Human Anatomy and Physiology II and Lab (4 units);
Major requirements. List all major requirements including core and electives. If applicable, list the emphasis requirements for each proposed emphasis*. Courses listed count towards major units and major GPA.	*Major Core: (37 units)* BSM 101 Introduction to Medical Care (2 units) BSM 305 Intro to Medical Devices, Technologies, Biotech and Pharma (3 units, New) BSM 441 Diagnostic Technologies and Their Role in Healthcare (3 units) PHCL 386 Intro to Tech Transfer in Medicine (3 units) BSM 4** Med Device, Biotech, Pharma Hands on Exposure and Clinical Applications (3 units, New) ENTR/BME/ENGR/LAW/MED/OPTI/PATH/SOC 481A/581A – Innovation, Translation and Entrepreneurship (2 units) ECON 200 – Basic Economic Issues (3 units) ACCT 250 – Survey of Accounting (Info for Business Decisions) (3 unit) BNAD 302 – Human side of Organization (3 units) BNAD 303 – Marketing Principles, Concepts, and Tools (3 units)

	LAW 478A - Legal & Regulatory Aspects for Health Care Delivery (3 units) LAW 479B - Legal & Regulatory Fundamentals of Health Care Business (3 units) LAW 480B - Data Privacy & Cybersecurity in Health Care (3 units) Emphasis 1- Medical Technology-Device (12 units) BME 295C Challenges in Biomedical Engineering (1 unit) BME 4** Technology and Big Data in Individualized Care (3 units, New) BME 486 Biomaterial-Tissue Interactions (3 units) BSM 319 The History of Medical Technology (2 units) CMM 465 Fundamentals of Light Microscopy and Digital Imaging FCM 4** Clinical Application of Medical Technology (3 units, New) HSD 401 Design for Health Workshop: Addressing Human Health Challenges with Design Thinking (Gen Ed Building Connections) (3 units) HSD 410 Device Design in the Health Sciences: Developing Tools for Health Care Solutions using Design Thinking (3 units) HSD 420 Healthy Design Practices: From the Makerspace to the Community (3 units) LAW 476A Drug Discovery, Development, and Innovation to Reach the Marketplace (3 units) MED 497 Research Development and Publishing (3 units) PHP 205 Fundamentals of Telehealth (3 units) Emphasis 2- Medical Technology-Biotech/Pharma CHEE 489 Trends in Nanomedicine Engineering - Fundamentals of Therapeutics and Drug Delivery Systems (3 units) MED 497 Research Development and Publishing (3 units) PHCL 412 Intro to Pharmacology (3 units) PHCL 460 Designing Drugs – from Chemistry to Cure (3 units) PHCL 467 Medicines to Market: Drug Discovery and Development (3 units)

	Emphasis 3- Medical Technology-Business and Marketing/Media BNAD 301 Global and Financial Economics and Strategies (3 units) OR BNAD 304 Survey of Finance (3 units) ENTR/MGMT 448 Healthcare Entrepreneurship (3 units) JOUR 480 Advanced Multimedia JOUR 497B Advanced Photojournalism JOUR 306 Advanced Reporting JOUR 385 Beginning Television Reporting and Production JOUR 280 Broadcast Writing JOUR 433 Digging with Data MED 497 Research Development and Publishing (3 units) MGMT 438 Healthcare Organization and Management (3 units) MKTG 307 Advertising Strategy & Practice MKTG 453 Brand Management MKTG 309 Marketing Communications in the Digital Age (2 units) MKTG 361 Introduction to Marketing (3 units) MKTG 306 Consumer Behavior (2 units) MKTG 423 Digital Marketing (3 units) MKTG 458 Health Care Marketing (3 units) Emphasis 4- Medical Technology-Regulatory-Law-Government BSM 320 Law and Medicine – Parallel Comparisons Through Time (3 units) FCM 302 Clinical Health Disparities in Sexual and Gender Minority (SGM) Populations (3 units) FCM 402/502 Addressing Health Disparities through Interprofessional Clinical-Community Collaboration (3 units) HIST 373 Politics of Health and Medicine in the Americas: From Historical Roots to Contemporary Development (3 units) JOUR 420 Digital Communications Law LAW 415 Health Care Ethics LAW 452 Health Law (3 units) LAW 475D Leadership and Equity in the Life Sciences LAW 478A Legal and Regulatory Aspects of Healthcare Delivery (3 units)

	LAW 480A Liability & Regulation of Health Care Professionals LAW 480C Health Information Technology LAW 484C Technology and Aging: Legal & Ethical Developments LAW 488A Translational Pathways for Medical Devices MED 497 Research Development and Publishing (3 units) PHIL 321 Medical Ethics (3 units) PHPM 310 Health Care in the U.S. (3 units)
Internship, practicum, applied course requirements (Yes/No). If yes, provide description.	*Optional working towards required (to be phased in)* New MED 4** Med Device, Biotech, Pharma Hands on Exposure and Clinical Applications (3 units) (Marv Slepian, Kellen Chen, Todd Vanderah) FCM 498 Community Health Field Training Experience (2 units) New PATH 4** Clinical Skills (path, pharm, phlebotomy, EKG, imaging, etc.) (2 units) (Mark Nelson) New FCM 4** Reflections on Clinical Medicine through Clinical Shadowing (Karyn Kohlman)
Senior thesis or senior project required (Yes/No). If yes, provide description.	No
Additional requirements (provide description)	No
Minor (specify if optional or required)	Optional
Any double-dipping restrictions (Yes/No)? If yes, provide description.	Yes, major core courses not permitted to double-dip. Supporting coursework may double-dip with other majors.

*Emphases are officially recognized sub-specializations within the discipline. ABOR Policy 2-221 c. Academic Degree Programs Subspecializations requires all undergraduate emphases within a major to share at least 40% curricular commonality across emphases (known as "major core"). Total units required for each emphasis must be equal. Proposed emphases having similar curriculum with other plans (within department, college, or university) may require completion of an additional comparison chart. Complete the table found in Appendix B to indicate if emphases should be printed on student transcripts and diplomas.

II. CURRENT COURSES–

THE UNIVERSITY OF ARIZONA

ADDITIONAL INFORMATION FORM

To be used once preliminary proposal has been approved.

Course prefix and number (include cross-listings)	Units	Title	Pre-requisites	Modes of delivery (online, in-person, hybrid)	Typically Offered (F, W, Sp, Su)	Dept signed party to proposal? (Yes/No)
MATH 163 Equivalent to: DATA 361, DATA 363, MATH 160, MATH 160-CC, MATH 163-CC, MATH 263, MATH 263-CC, MATH 363	3	Basic Statistics	PPL 60+ or MCLG 88+ or SAT I MSS 640+ or ACT MATH 26+ or one recent course from MATH 108, 112, 113, 116, 119A, 122B, or 125.	In-person	F, Sp	
MCB 181R Equivalent to: BIOC 181R, ECOL 181R, MCB 184, MCB 315, MIC 181R	3	Introduction to	PPL 40+ or SAT I MSS 560+ or ACT MATH 24+ or one course from Math 108, 112, 113, 119A, 120R, 124, 122B, 125, 129, or 223.	In-person,	F, Sp, Su	
MATH 263 Equivalent to: DATA 361, DATA 363, MATH 160, MATH 160-CC, MATH 163-CC, MATH 361-CC, MATH 363		Introduction to	PPL 60+ or MCLG 88+ or SAT I MSS 640+ or ACT MATH 26+ or one recent course from MATH 108, 112, 113, 116, 119A, 122B, or 125	In-person	F, Sp, Su	
CHEM 130	4	Chemistry for Allied & Public Health	Algebra recommended	In-person, online	F, Sp, Su	
PHYS 102/181 or PHYS 141/142	4	Physics I	PPL 60+ or SAT I MSS 610+ or ACT MATH 26+ or one course	In-person, online	In-person: F, Sp, Su PHYS 102	

			from MATH 108, 112, 113, 116, 119A, 120R, 122B, 125, 129, or 223 PHYS 141: MATH 122B, 124, or 125, or appropriate Math Placement Level	PHYS 141: In-person	Online: F PHYS 141: F, Sp, Su	
PHYS 103/182 or PHYS 241	4	Introductory Physics II	PHYS 102 OR PHYS 141 or PHYS 140 or PHYS 161H	In-person, online	F, Sp, Su	
AREC 239	4	Introduction to Statistics and Data Analysis	PPL 60+ or MCLG 88+ or SAT I MSS 640+ or ACT MATH 26+ or one recent course from MATH 112, 113, 116, 122B, or 125	In-person	Sp	
BME 376	3	Biomedical Statistics	MATH 129 and Advanced standing	In-person	F	
PSIO 201	4	Human Anatomy and Physiology I and Lab		In-person	F, Sp, Su	
PSIO 202	4	Human Anatomy and Physiology II and Lab	PSIO 201	In-person	F, Sp, SU	
BSM 101	2	Introduction to Medicine	None listed	In-person	F, Sp	Yes
BSM 4**	3	Introduction to Medical Devices, Technologies, Biotech and Pharma				Yes
BSM 441	3	Diagnostic Technologies and Their Role in Healthcare	PSIO 201 & 202	In-person	F, Sp	Yes
ENTR 481A Equivalent to: BME 481A, ENGR 481A, ENTR 481A, LAW 481A,	2	Innovation, Translation and Entrepreneurship	None listed	In-person	Sp	Yes

OPTI 481A, PATH 481A, SOC 481A						
ECON 200	3	Basic Economic Issues	None listed	In-person, Flex in-person, online	F, W, Sp, Su	
ACCT 250	3	Survey of Accounting (Info for Business Decisions)	None listed	In-person	F, Sp, Su	
BNAD 302	3	Human Side of Organization	None listed	In-person	Contact Department	
BNAD 303	3	Marketing Principles, Concepts, and Tools	None listed	In-person	Contact Department	
LAW 478A/578A	3	Legal & Regulatory Aspects for Health Care Delivery	None listed	Online	F	
LAW 479B/579B	3	Legal and Regulatory Fundamentals for Health Care Business	None listed	Online	Sp	
LAW 480B/580B	3	Data Privacy & Cybersecurity in Healthcare	None listed	Online	Sp	
PHCL 386 Also offered as BSM 386	3	Intro to Tech Transfer in Medicine	None listed	In-person	F	Yes
CMM 465	3	Fundamentals of Light Microscopy and Digital Imaging				
LAW 476A	3	Drug Discovery, Development, and Innovation to Reach the Marketplace	None listed	online	not been scheduled	
BSM 319	2	Medical Technology - Past, Present & Future	None listed		not been scheduled	Yes
PHP 205	3	Telehealth: It is not just about Clinical Care	None	Online	F	

HSD 401	3	Design for Health Workshop: Addressing Human Health Challenges with Design Thinking	First-Year English Composition: (ENGL 101 and 102) or (ENGL 103H and 104H) or (ENGL 107 and 108) or ENGL 109H.	In-person	F, Sp	
HSD 410 Also offered as BSM 410	3	Device Design in the Health Sciences: Developing Tools for Health Care Solutions using Design Thinking	Junior or Senior standing AND previous completion of Calculus I (MATH 122B, or MATH 125, or equivalent transfer course), or with instructor permission.	In-person	F, Sp	
HSD 420 Also offered as HSD 476, INFO 476	3	Healthy Design Practices: From the Makerspace to the Community	None listed	In-person	Sp	
CHEE 489	3	Trends in Nanomedicine Engineering - Fundamentals of Therapeutics and Drug Delivery Systems	Advanced Standing: Engineering. MATH 254 and (CHEM 481 or CHEM 480A or [BIOC 462A and 462B]).	In-person	Sp	
PHCL 412	3	Intro to Pharmacology	Students are strongly encouraged (but not required) to have taken at least one course in human anatomy and/or physiology prior to enrolling in this course.	In-person	F	Yes
PHCL 460	3	Designing Drugs – from Chemistry to Cure	(BIOC 384 or BIOC 385) and PCOL 406 and PCOL 410	In-person	Sp	Yes

PHCL 467	3	Medicines to Market: Drug Discovery and Development	None listed	In-person	F, Sp, Su	Yes
BNAD 301	3	Global and Financial Economics and Strategies	ECON 200 or (ECON 201A and ECON 201B).	In-person	Contact Department	
BNAD 304 Equivalent to BAD 304	3	Survey of Finance	None listed	Online	Contact Department	
ENTR 448 Also offered as MGMT 448	3	Healthcare Entrepreneurship	None listed	In-person	Sp	
JOUR 280	3	Broadcast Writing	Major: JOUR. JOUR 205 with a C or better.	In-person	Sp	
JOUR 306	3	Advanced Reporting	Major: JOUR. JOUR 205 with a C or better.	In-person	F, Sp	
JOUR 385	3	Beginning Television Reporting and Production	Major: JOUR. JOUR 203 and JOUR 280.	In-person	F, Sp	
JOUR 433	3	Digging with Data	None listed	In-person	Sp	
JOUR 480	3	Advanced Multimedia	Students must EITHER take JOUR 307 OR [JOUR 319 and SBS 350].	In-person	Sp	
JOUR 497B	3	Advanced Photojournalism	Major: JOUR. JOUR 203.	In-person	Sp	
MGMT 438 Equivalent to PA 438	3	Health Care Organization and Management	None listed	In-person	F, Sp	
MKTG 306	2	Consumer Behavior	BNAD 303 and one of the following: ACCT 200, ECON 200 or MKTG 301. Acceptance into Marketing Minor Program, contact department.	Online	Su	

MKTG 307	2	Advertising Strategy & Practice	BNAD 303 and one of the following: ACCT 200, ECON 200 or MKTG 301. Acceptance into Marketing Minor Program, contact department.	Online	Su	
MKTG 309 – Marketing Communications in the Digital Age	2		BNAD303 and one of the following: ACCT 200, ECON 200 or MKTG 301.	Online	Su	
MKTG 361	3	Introduction to Marketing	Professional Admission: Accounting, Business Administration, Business Management, Business Economics, Entrepreneurship, Finance, Marketing, Management Information Systems, Operations & Supply Chain Management.	In-person	F, Sp, Su	
MKTG 423	3	Digital Marketing	Professional Admission: Marketing. MKTG 361.	In-person	F, Sp	
MKTG 453	3	Brand Management	None listed	In-person	F, Sp	
MKTG 458 Also offered as PHPM 458	3	Health Care Marketing	Majors: Public Health, Marketing, Public Management, Public Management & Policy,	Online	Sp	

			Business Administration, and Entrepreneurship. Senior status.			
FCM 302	3	Clinical Health Disparities in Sexual and Gender Minority (SGM) Populations	None listed		F	
FCM 402/502	3	Addressing Health Disparities Through Interprofessional Clinical - Community Collaborations	None listed		not been scheduled	
HIST 373 Also Offered as LAS 373	3	Politics of Health and Medicine in the Americas: From Historical Roots to Contemporary Development	None listed	Online	Sp	
JOUR 420	3	Digital Communications Law	Open to Journalism, eSociety, and Law majors.	In-person	Varies	
LAW 415	3	Health Care Ethics	None listed		Not been scheduled	
LAW 452	3	Health Law	None listed	In-person	F	
LAW 475D	3	Leadership and Equity in the Life Sciences	None listed	Online	Sp	
LAW 480C	3	Health Information Technology	None listed	Online	F	
LAW 484C	3	Technology and Aging: Legal & Ethical Developments	None listed	Online	F	
LAW 488A	3	Translational Pathways for Medical Devices	None listed	Online	Su	

LAW 478A	3	Legal and Regulatory Aspects of Healthcare Delivery	None listed	Online	F	
LAW 480A	3	Liability and Regulation of Healthcare Professionals	None listed	Online	Su	
BSM 320	3	Law and Medicine: Parallel Comparisons Through Time	Students who completed Medicine - Past Present and Future MED 318 are ineligible to take this course.		not been scheduled	Yes
PHIL 321 Also Offered as: PA 321	3	Medical Ethics	2 courses from Tier One - Traditions/Cultures	In-person, online	F, W, Sp, Su	
PHPM 310	3	Health Care in the U.S.	Two courses from Tier One- Individuals/Societies.	In-person, online	F, Sp	
MED 497/597	3	Research Development and Publishing	Instructor Consent Required	In-Person	F, Su, Sp	

III. NEW COURSES NEEDED – using the table below, list any new courses that must be created for the proposed program. If the specific course number is undetermined, please provide level (i.e., CHEM 4XX). Add rows as needed.

Course prefix and number (include cross-listings)	Units	Title	Pre-requisites	Modes of delivery (online, in-person, hybrid)	Status*	Anticipated first term offered	Typically Offered (F, W, Sp, Su)	Dept signed party to proposal? (Yes/No)	Faculty members available to teach the courses
BSM 305	3	Introduction to Medical Devices, Technologies, Biotech and Pharma	NA	Hybrid	D	Fall 2026	F, Sp	Yes	Yes

BSM 441	3	Diagnostic Technologies and Their Role in Healthcare	PSIO 201 & 202	In-person	S	Fall 2024	F, Sp		Yes
BME 4**		Technology and Big Data in Individualized Care	NA	Hybrid	D	Fall 2027	Fall	Yes	Yes
FCM 4**		Clinical Application of Medical Technology	NA	In person		Fall 2028	Fall, Spring	Yes	Yes

*In development (D); submitted for approval (S); approved (A)

IV. FACULTY INFORMATION-

Faculty Member	Involvement	UA Vitae link or Box folder link
Marv Slepian	Chair, organizing committee; Regents Professor Medicine, Surgery and BME	
Todd Vanderah	Senior Advisor and Co-Associate Chair, organizing committee; Dept Head, Pharmacology	
Kellen Chen	Co-Associate Chair, organizing committee; Surgery	
Jameshia Granberry	Member, organizing committee; COM-T	
Ann Pagel	Member, organizing committee; College of Management	
Jayanthi Sunder	Member, organizing committee; College of Management	
Mario Romero-Ortega Philip Gutruf	Member, organizing committee; BME	
Tara Sklar Keith Swisher	Member, organizing committee; Law	
Doug Hockstad Rakhi Gibbons	Member, organizing committee; Tech-Launch	

Michael Abecassis	Member, organizing committee; Dean College of Medicine- Tucson	

V. GRADUATION PLAN –

Semester 1		Semester 2		Semester 3		Semester 4	
Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units
MATH 112	3	CHEM 130 and 130L	4	ECOL 182R	3	General Ed- Exploring Perspectives Social Scientist	3
ENGL 101/107/109H	3	ENGL 102	3	ECOL 182L	1	General Ed- Building Connections Option*	3
BSM 101	2	MCB 181R	3	PHYS 102/ 110	3	PHYS 103/ 111	3
Gen Ed-Building Connections	3	MCB 181L	1	PHYS 181	1	PHYS 182	1
Second Semester Second Language	4	MATH 163/263, BME 376 Statistics	3	ACCT 250	3	PSIO 201	4
UNIV 101 Gen Ed	1	ECON 200	3	General Ed- Exploring Perspectives Humanist*	3	BSM 305	3
Total	16	Total	17	Total	14	Total	17

Semester 5		Semester 6		Semester 7		Semester 8	
Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units
PSIO 202	4	BNAD 303	3	General Elective	1	Emphasis Elective	3

BSM 441	3	MED 481A	2	LAW 478A	3	Emphasis Elective	3
PHCL 386	3	LAW 480B	3	LAW 479B	3	General Elective	3
General Education-Exploring Perspectives Artist	3	General Education-Building Connections Option	3	Emphasis Elective	3	General Elective	3
BNAD 302	3	BSM 4** Med Device, Biotech Pharma	3	Emphasis Elective			
		UNIV 301- General Education	1				
Total	16	**Total**	15	**Total**	13	**Total**	12

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ADDITIONAL INFORMATION FORM

To be used once preliminary proposal has been approved.

VI. Learning Outcomes and Curriculum Map - Complete these tables as a summary of the learning outcomes from your assessment plan and an overview of where learning outcomes are addressed in the program. Use the examples below as models and refer to the explanations beneath each table. Additional resources are available from the University Center for Assessment, Teaching and Technology.

Learning Outcomes

Major Learning Outcome #1: Students can recognize and articulate knowledge of the structure and function of the human body in health and disease including use of appropriate medical terminology and apply this knowledge to evaluation of disease therapies.
Concepts: clinical problem-solving in medical cases, use of technology to diagnose and treat across a spectrum of organ and body systems
Competencies: ability to describe components of medical cases, recognize trustworthy resources for medical knowledge, identify technologies for diagnosis across different body systems
Assessment Methods: embedded exam questions in BSM 441(direct), written assignment in BSM 101 based on rubric (direct), and student exit survey (indirect)
Measures: instructor grading of assignments and exams, responses to student exit survey
Major Learning Outcome #2: Students can apply core principles of organizational behavior, fundamental accounting, economics, effective management, regulation and ethics in the workplace, and human relations to make informed decisions about managing people, finances, and ethical challenges in the workplace.
Concepts: workplace communication etiquette, basic financial knowledge, managing conflict, and ethical decision-making
Competencies: articulate a fundamental understanding of business principles and practical competencies for running a functional organization
Assessment Methods: embedded exam questions in ECON 200 and BNAD 303 (direct), final research paper in LAW 478A and Financial Statement/Managerial Assignment in ACCT250 based on rubric (direct), and student exit survey (indirect)
Measures: instructor grading of assignments and exams, responses to student exit survey
Major Learning Outcome #3: Students can apply their knowledge of emerging medical technologies and the development and validation process of new medical technology to evaluate the risks and rewards related to health science.
Concepts: different modes of emerging technologies (wearables, remote monitoring, etc.), medical subspecialties' dependence on technologies, technology patents from a business perspective
Competencies: Identify unmet needs in medical technology, articulate the process for an intellectual property licensing agreement, evaluate the risks and reward related to health science technologies.
Assessment Methods: homework and team projects in ENTR 481A (direct), embedded exam questions in PHCL 386, BSM 441, and ENTR 481A (direct), and student exit survey (indirect)
Measures: instructor grading of homework assignments, projects, quizzes and exams, responses to student exit survey

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*Explanation: **Concepts** are the topics that students will learn in the program. **Competencies** are the skills they will learn. A **learning outcome** is their ability to apply the skills to the topics, or to use the skills and the topics together, in an observable way. The **assessment method** is where students will demonstrate the learning outcome, and a **measure** is how data will be pulled from the assessment method. Include both a direct and indirect assessment method and measurement for each learning outcome. Competencies and the learning outcomes need to reflect higher level learning: consider using verbs from the Application, Analysis, Synthesis, and Evaluation columns from this list when writing learning outcomes: https://arizona.app.box.com/s/orx6coex8607hlmenrgl7dznhzjicpit. We recommend 3-5 Learning Outcomes for a degree program.*

	BSM 101	BSM 305	BSM 441	PHCL 386	BSM 4**	ENTR 481A	ECON 200	ACCT 250	BNAD 302	BNAD 303	LAW 478A	LAW 479B	LAW 480B
LO #1: Students can recognize and articulate in-depth knowledge of the structure and function of the human body in health and disease including use of appropriate medical terminology and apply this knowledge to evaluation of disease therapies.	I		M		M								
LO #2: Students can apply core principles of organizational behavior, fundamental accounting, economics, effective management, regulation and ethics							I	I	M	R	M	I	R

in the workplace, and human relations to make informed decisions about managing people, finances, and ethical challenges in the workplace.												
LO #3: Students can apply their knowledge of emerging medical technologies and the development and validation process of new medical technology to evaluate the risks and rewards related to health science.		I	R	R	M	M						

Emphasis 1: Medical Technology-Device

Learning Outcome #1: Students can recognize and articulate the need, type, scope, and utility of medical device technology, and relate the complex datasets generated to the development of device technology and the practice of precision medicine.
Concepts: imaging modalities and testing methods in clinical practice for diagnosis, evaluation methods, and role of AI in image reconstruction, interpretation, and decision-making
Competencies: ability to describe common diagnostic imaging modalities, explain development process of new diagnostic technology, articulate the role of AI in image reconstruction, interpretation, and decision-making
Assessment Methods: homework and team projects, embedded exam questions (direct), and student exit survey (indirect)
Measures: instructor grading of homework assignments, projects, quizzes and exams, responses to student exit survey

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Curriculum Map: Which courses in the emphasis connect to this learning outcome? Use the table below to provide the information, Key: "I" = Introduced; "R"= reinforced and opportunity to practice; "M"= mastery at the senior or exit level; "A"= assessment evidence collected for program-level decision making

Courses	*Emphasis 1 Student Learning Outcomes*
	LO 1
BME 486	*R*
LAW 476A	*R*
HSD 401	*I/R*
HSD 410	*R/M*
HSD 420	*M*

Emphasis 2: Medical Technology-Biotech/Pharma

Learning Outcome #1: Students can recognize and articulate the need, type, scope and utility of Medical Biotechnology and Pharmaceutical technology/Industry and demonstrate knowledge of the procedures for bringing new technologies to market.
Concepts: fundamental issues encountered by entrepreneurial Research & Development professionals; considering scientific, business, regulatory and legal requirements of developing pharmaceuticals and biotechnologies that are brought to the market
Competencies: ability to recognize clinical development activities needed for safety, proof-of-concept and approval for on-market use for patients. Consider the economic feasibility for funding medical biotechnology and pharmaceutical technology to market.
Assessment Methods: embedded exam questions (direct), and student exit survey (indirect)
Measures: instructor grading of homework assignments, quizzes and exams, responses to student exit survey

Curriculum Map: Which courses in the emphasis connect to this learning outcome? Use the table below to provide the information, Key: "I" = Introduced; "R"= reinforced and opportunity to practice; "M"= mastery at the senior or exit level; "A"= assessment evidence collected for program-level decision making

Courses	*Emphasis 2 Student Learning Outcomes*
	LO 1
PHCL 412	*I*
PHCL 467	*R/M*
PHCL 460	*M*
CHEE 489	*I/R*

Emphasis 3: Medical Technology-Business and Marketing/Media

Learning Outcome #1: Students can evaluate and recognize the application of commercialization, marketing and sales, communication, information conveyance and advertising the broad business space of Medical Devices, Biotechnology and Pharmaceutical Technology.
Concepts: financial and managerial accounting topics, microeconomics and macroeconomics, organizational behavior, human relations, ethical decision-making, innovation, corporate governance, and strategies in a global business environment
Competencies: ability to understand/prepare financial and managerial accounting reports, financial performance analysis, understanding of economic principles, business markets, innovation and development
Assessment Methods: homework and projects with real data, embedded exam questions (direct), and student exit survey (indirect)
Measures: instructor grading of homework assignments, projects and exams, responses to student exit survey

Curriculum Map: Which courses in the emphasis connect to this learning outcome? Use the table below to provide the information, Key: "I" = Introduced; "R"= reinforced and opportunity to practice; "M"= mastery at the senior or exit level; "A"= assessment evidence collected for program-level decision making

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ADDITIONAL INFORMATION FORM

To be used once preliminary proposal has been approved.

Courses	*Emphasis 3 Student Learning Outcomes*
	LO 1
BNAD 301/304	*I*
MGMT 438	*M*
JOUR 433	*R*
MKTG 361	*I*
MKTG 309	*R*
MKTG 453	*M*

Emphasis 4: Medical Technology-Regulatory-Law-Government

Learning Outcome #1: Students can evaluate and recognize the application of the fundamental regulatory, legal and governmental aspects applicable and operative in Medical Device Technology, Biotechnology and Pharmaceutical Technology.
Concepts: regulations and policies that govern healthcare systems, funding, advances in technology, HIPAA, privacy and security, and intellectual property
Competencies: identify and describe legal and regulatory requirements around funding, technology, cybersecurity and protection of data in healthcare settings, knowledge of patents and other forms of intellectual property
Assessment Methods: short papers and assignments, embedded exam questions (direct), and student exit survey (indirect)
Measures: instructor grading of exams, papers and homework assignments, responses to student exit survey

Curriculum Map: Which courses in the emphasis connect to this learning outcome? Use the table below to provide the information, Key: "I" = Introduced; "R"= reinforced and opportunity to practice; "M"= mastery at the senior or exit level; "A"= assessment evidence collected for program-level decision making

Courses	*Emphasis 4 Student Learning Outcomes*
	LO 1
JOUR 420	*I*
LAW 452	*I/R*
LAW 477	*I/R*
LAW 478A	*M*
LAW 480A	*M*
LAW 488A	*R*

VII. PROGRAM ASSESSMENT PLAN-

Assessment Measure	Source(s) of Evidence	Data Collection Point(s)
Program Evaluation Length of time to graduation Student program assessment Academic Program Review	 Department generated statistics Department Senior Exit Survey Student/Alumni Survey	 Every Year During Spring semester of senior At graduation and as part of alumni survey
Completion Evaluation Job Placement Statistics	 Student/Alumni Survey/Social Media	At graduation and as part of alumni survey, 2, 5, 7 and every 7 years after that for APR

Graduate/Professional Program Enrollment	Reviewers' responses	

VIII. ANTICIPATED STUDENT ENROLLMENT-complete the table below. What concrete evidence/data was used to arrive at the numbers?

5-YEAR PROJECTED ANNUAL ENROLLMENT					
	1st Year	2nd Year	3rd Year	4th Year	5th Year
Number of Students	25	75	125	250	400

Data/evidence used to determine projected enrollment numbers:

The projected enrollment number is based on current student survey results, class size and faculty teaching loads. From up-and-coming graduates looking to kickstart their MDTD careers to experienced health technology professionals eager for their next challenge, the medical device technology development industry offers an abundance of opportunities for candidates at all stages of their careers. In the USA alone, the industry is responsible for the creation of over 2 million jobs, and given the unstoppable growth of innovative health technologies, it is likely that the sector will continue creating employment opportunities for the foreseeable future.

With the demand for medical technology professionals far outpacing demand, now is a better time than ever for high-quality graduates to pursue careers in MDTD. As well as excellent job prospects, MDTD candidates can expect relatively high salaries, the chance to make a positive difference to the world's well-being, and continuous challenges and advancement opportunities.

A rapidly aging population, the shift toward delivering in-home healthcare, and the increasing prevalence of diabetes, hypertension, and other chronic diseases are key developments expected to boost medical device sales in the next decade. Simultaneously, technological advances are revolutionizing the medical device industry, not only increasing the number of connected, patient-centric medical devices going to market but also strengthening their role in healthcare. The global medical devices market totaled $489 billion in 2021 and may top $500 billion in 2022. One estimate forecasts the market expanding to $719 billion by 2029 — an annualized rate of 5.5% from 2022 to 2029.

References:

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National Health Expenditures. Retrieved from https://www.cms.gov/data-research/statistics-trends-and-reports/national-health-expenditure-data

Cohen, I. G., Minssen, T., Price, W. N., Robertson, C. T., & Shachar, C. (Eds.). (2022). Innovation and protection: the future of medical device regulation. Cambridge University Press.

U.S. Bureau of Labor Statistics. Occupational Outlook Handbook. Healthcare Occupations. Retrieved from https://www.bls.gov/ooh/healthcare/home.htm (updated September 6, 2023)

IX. ANTICIPATED DEGREES AWARDED-

PROJECTED DEGREES AWARDED ANNUALLY					
	1st Year	2nd Year	3rd Year	4th Year	5th Year
Number of Degrees	NA	10	50	100	200

Data/evidence used to determine number of anticipated degrees awarded annually:
These numbers were derived based on the assumption that the trend in graduates will trail behind the estimated enrollment due to attrition and time to complete the requirements, which is expected to be 2-3 years

Appendix A. Minor Requirements. N/A

Appendix B. Emphasis Print Information-

Emphasis	Print on transcript	Print on diploma
Medical Technology - Device	Yes	Yes
Medical Technology – Biotech/Pharma	Yes	Yes
Medical Technology – Business and Marketing/Media	Yes	Yes
Medical Technology – Regulatory-Law-Government	Yes	Yes

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BUDGET PROJECTION FORM

Name of Proposed Program or Unit: Bachelor of Sciences in Medical Device and Technology Development

	Projected		
Budget Contact Person: Jason Marr	**1st Year** 2025 - 2026	**2nd Year** 2026 - 2027	**3rd Year** 2027 - 2028
METRICS			
Net increase in annual college enrollment UG	25	75	125
Net increase in college SCH UG	825	2,450	4,025
Number of Faculty FTE	0.40	0.40	0.40
FUNDING SOURCES			
Continuing Sources			
UG AIB Revenue	164,675	489,300	804,475
Grad AIB Revenue			
Program Fee Revenue (net of revenue sharing)			
F and A AIB Revenues			
Reallocation from existing College funds (attach description)			
Other Items (attach description)			
Total Continuing	**$ 164,675**	**$ 489,300**	**$ 804,475**
One-time Sources			
College fund balances	246,000		
Institutional Strategic Investment			
Gift Funding			
Other Items (attach description)			
Total One-time	**$ 246,000**	**$ -**	**$ -**
TOTAL SOURCES	**$ 410,675**	**$ 489,300**	**$ 804,475**
EXPENDITURE ITEMS			
Continuing Expenditures			
Faculty	115,430	117,739	120,093
Other Personnel	174,000	177,480	181,030
Employee Related Expense	92,618	94,470	96,359
Graduate Assistantships			
Other Graduate Aid			
Operations (materials, supplies, phones, etc.)	3,000	3,000	3,000
Additional Space Cost			
Other Items (attach description)			
Total Continuing	**$ 385,048**	**$ 392,689**	**$ 400,482**
One-time Expenditures			
Construction or Renovation	25,000		
Start-up Equipment			
Replace Equipment			
Library Resources			
Other Items (attach description)			
Total One-time	**$ 25,000**	**$ -**	**$ -**
TOTAL EXPENDITURES	**$ 410,048**	**$ 392,689**	**$ 400,482**
Net Projected Fiscal Effect	**$ 627**	**$ 96,611**	**$ 403,993**

Expenses

Title	FTE	Salary	Role (gross)	ERE
Director	0.30	$ 350,600	$ 105,180	$ 33,658
Assoc Director	0.10	$ 102,500	$ 10,250	$ 3,280
Program Coordinator	1.00	$ 65,000	$ 65,000	$ 20,800
Administrative Assistant	1.00	$ 54,000	$ 54,000	$ 17,280
Advisor	1.00	$ 55,000	$ 55,000	$ 17,600
Total			**$ 289,430**	**$ 92,618**

1 lab, 600-800 sq ft
1 Anteroom, 200 sq ft
2 Offices, 300-400 sq ft
1 storage space

AIB Revenue

	Yr1	Yr2	Yr3
Projected Enrollment	25	75	125
$ / enrollment	$ 350	$ 350	$ 350
Enrollment Revenue	$ 8,750	$ 26,250	$ 43,750

COM-T Only:	Yr1	Yr2	Yr3
Projected SCH	50	550	1,375
$ / SCH	$ 189	$ 189	$ 189
SCH Revenue	$ 9,450	$ 103,950	$ 259,875

All:	Yr1	Yr2	Yr3
Projected SCH	825	2,450	4,025
$ / SCH	$ 189	$ 189	$ 189
SCH Revenue	$ 155,925	$ 463,050	$ 760,725

All AIB Revenue:	**$ 164,675**	**$ 489,300**	**$ 804,475**

Total net tuition / UG student		$ 6,977	
Total UA Tuition Revenue, net	$ 174,414	$ 523,243	$ 872,072
Housing	$ 30,000	$ 90,000	$ 150,000
Student Union	$ 12,500	$ 37,500	$ 62,500
Campus Health	$ 2,500	$ 7,500	$ 12,500
Bookstores	$ 12,500	$ 37,500	$ 62,500
Parking	$ 7,500	$ 22,500	$ 37,500
Total auxiliary	$ 65,000	$ 195,000	$ 325,000
Total UA Revenue	**$ 239,414**	**$ 718,243**	**$ 1,197,072**

	Total Cost	
$	138,838	
$	13,530	
$	85,800	
$	71,280	
$	72,600	
$	**382,048**	Annual, ongoing

$	**-**	One-time

	$/Student
Housing	$ 1,200
Student Union	$ 500
Campus Health	$ 100
Bookstores	$ 500
Parking	$ 300

		FY15	FY16
Auxiliary Units			
	External Revenue		
	Housing & Res Life		
	Per FTE		
	Student Union		
	Per FTE		
	Campus Health		
	Per FTE		
	Campus Rec		
	Per FTE		
	BookStores		
	Per FTE		
	Parking & Transportation		
	Per FTE		
Fees			
	Mandatory Fees	39,167,700	40,128,833
	Per FTE	924	926
	Misc Fees	17,513,400	18,652,192
	Per FTE	413	431
	Study Abroad		
Student FTE Fall Census		42,388.1	43,323.1

FY17	FY18	FY19	FY20	FY21
		53,419,419 1,204	55,136,853 1,233	43,291,763 951
		29,430,979 663	25,048,474 560	12,100,158 266
		7,613,415 172	6,865,399 154	5,244,664 115
		2,217,036 50	1,369,205 31	722,265 16
		26,478,915 597	21,949,754 491	16,409,454 361
		18,054,646 407	16,468,812 368	10,098,958 222
39,898,700 916	43,915,500 995	46,880,200 1,056	49,585,161 1,109	50,682,663 1,113
19,324,900 444	21,135,900 479	21,927,900 494	20,020,617 448	20,136,577 442
	11,709,916 265	9,974,847 225	3,995,405 89	1,376,761 30
43,570.1	44,128.9	44,375.9	44,713.7	45,516.7

FY22	Planning Assumption
62,904,555	
1,343	1,200
28,034,608	
599	500
5,804,582	
124	100
1,791,782	
38	-
20,830,130	
445	500
17,288,017	
369	300
52,559,321	
1,122	1,100
23,466,650	
501	500
8,791,552	
188	100
46,828.7	

THE UNIVERSITY OF ARIZONA

New Academic Program
PEER COMPARISON

Program name, degree, and institution	Medical Device Technology Development, Bachelor of Science, University of Arizona	BS in Health Entrepreneurship and Innovation, Bachelor of Science, Arizona State University, Edson College of Nursing and Health Innovation	BS in Health Technology, Bachelor of Science, University of Illinois at Urbana-Champaign (UIUC)	BS in Health Services Management, Bachelor's of Science, University of Minnesota
Current number of students enrolled		17 new students in Fall 2024	45 in concentration	208 in the major 227 in major/minor combined
Program Description	The Bachelor of Science in Medical Device and Technology Development (MDTD) is a four-year degree program designed and delivered as a collaboration between clinicians, basic scientists, engineering, business and law, with focus on learning about the medical field devices and technology that would offer students multiple avenues upon graduation. The program would allow	The BS program in health entrepreneurship and innovation provides a broad background in the principles of innovation, leadership, complexity science, change theory, collaboration and evidence-based decision-making to ensure that its graduates are prepared to manage implementation of innovation in the health care arena. Through the use of evidence-based decision-making and leadership skills in interprofessional teams, students learn to tackle health care challenges using	Develop the skills and knowledge needed to implement and support information technology solutions for health sector organizations. Coursework will focus on the areas of health information management including health information processing and exchange, health care analytics, enterprise management, and information storage and security management.	Health services managers direct, plan, or coordinate medical and health services in hospitals, clinics, managed care or health insurance companies, pharmaceutical or medical device organizations, long term care facilities, public health agencies, and many more. Health services managers are the business leaders who help run these organizations, working to improve access and delivery of healthcare services.

	students to learn the basics in the medical health field while expanding into areas of interest that would include the business of medical devices, creating/engineering of devices as well as the legal/regulatory components of medical devices. The program juxtaposes applied topics such as what it is to be an individual that helps develop medical devices, or goes into the sales or use of devices, works in the regulatory fields of medical devices and/or goes onto professional degree programs that allows one to utilize such devices in their health care filed. The rapidly growing field of medical devices and the MDTD BS program would allow for hands-on experience through simulation in addition to information	modern technology, public policy and communication. This unique program situates students at the intersection of innovation and entrepreneurship, enabling them to develop their own solutions to health challenges.		

	delivered in the classroom setting.			
Target Careers	Biomedical Engineer, Clinical Informationist, Medical Device Designer, Healthcare Data Analyst, Telemedicine Specialist, Health IT Consultant	entrepreneurs health architects health care administrators health care strategists, advisors, project managers and administrators health innovation consultants health product and service managers health system designers intrapreneurs --- managers responsible for promoting innovative product development and marketing public relations experts in health	Many pursue a pre-health path post-graduation Some consider the Health Tech Masters Program	Medical Office / Clinic Manager Healthcare Data Analyst Medical and Pharmaceutical Sales Healthcare Operations Manager Patient/Client Care Coordinator Quality & Patient Safety Manager Healthcare Project Manager Long-Term Care Administrator Client Services Specialist Account Manager Health System Manager Patient Access Supervisor Health Insurance Analyst Human Resources Generalist Digital Client Services Manager Admissions Supervisor Healthcare Consultant Business Office Manager Accounting / Billing Systems Specialist
Emphases? (Yes/No) List, if applicable	Yes 1. Medical Technology – Device	No, but has associated accelerated masters	This degree is a concentration within the	No. Minor and Certificate programs available.

	2. Medical Technology – Biotech/Pharma 3. Medical Technology – Business and Marketing/Media 4. Medical Technology – Regulatory-Law-Government 5. Basic and Clinical Medical Sciences	programs in Aging and Healthcare Innovation	Interdisciplinary Health Sciences Degree	
Minimum # of units required	120	120	128	120
Level of Math required	Moderate: College Algebra or higher along with statistics	College Mathematics Math Intensity: General	Biostatistics	Introduction to Statistics
Level of Second Language required	2nd semester proficiency	Not required	3rd semester second language	Not required
Special requirements to declare/gain admission?	No	No	No	30 transferable credits 2.5+ GPA Demonstrated interest in HSM field
Internship, practicum, or applied/experiential requirements? If yes, describe.	Not required. Internship opportunities may be available.	Not required. Internship opportunities are available though.	Yes, an internship is required for Interdisciplinary Health Sciences degree.	Yes, Health Services Management Internship Leadership and Business Planning in Health Care - Capstone

Additional questions:

1. How does the proposed program align with peer programs? Briefly summarize the similarities between the proposed program and peers, which could include curriculum, overall themes, faculty expertise, intended audience, etc.

All programs have a focus on understanding the function of medical devices. The MS degree from University of Minnesota and the BS degree from New Jersey Technical Institute share a focus on design, innovation and development with the proposed MDTD program. Target careers for the three programs share significant overlap with the proposed MDTD program.

2. How does the proposed program stand out or differ from peer programs? Briefly summarize the differences between the proposed program and peers, which could include curriculum, overall themes, faculty expertise, intended audience, etc.

The truly unique aspect of the proposed MDTD program is that it has a lower math requirement, requiring only College Algebra and statistics. The other programs require some form of Calculus, as does the Biomedical Engineering degree at UA. The MDTD program has some exposure to biomedical engineering and an additional focus on regulation, policy, physiology, and business. The only peer program that shares those additional subjects is the Master's degree from University of Minnesota.

At the University of Arizona, the BS in Medicine prepares graduates for medical school, graduate programs in allied health, or careers in clinical care, whereas the BS MDTD degree program aims to immediately prepare students for the workforce, does not require biochemistry, and allows students to a pursue a multidisciplinary curriculum steeped in courses across several colleges at the University of Arizona while limiting the prerequisites and co-requisites required to complete the degree.

3. How do these differences make this program more applicable to the target student population and/or a better fit for the University of Arizona?

This degree provides opportunity for a non-math broad focused major in device development creating an alternate path for students to access the field of medical device technology. The variety of topics introduced in this major help to address the concepts with which biological technicians/technologists often struggle, e.g. strategy, financing, proof of concept, intellectual property, drug discovery, and policy.

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THE UNIVERSITY OF ARIZONA
Eller College of Management

March 1, 2024

Marvin Slepian, M.D.
Regents Professor of Medicine – Division of Cardiology
Regents Professor and Associate Department Head – Biomedical Engineering
University of Arizona College of Medicine – Tucson

Dear Marvin:

In my role as Dean of Eller College of Management, I am writing this letter in strong support of the College of Medicine-Tucson proposal for a new Bachelor of Science in Medical Device Technology Development.

This new Bachelor of Science in Medical Device Technology Development degree will help grow the overall number of students coming to University of Arizona as well as those enrolling on-line. In addition, several Colleges/Departments/Center faculty members are leaders in their fields and are uniquely qualified to contribute to the program. The proposed program emanates from a partnership between the College of Engineering, James E. Rogers College of Law, Eller College of Management, College of Medicine Tucson, University of Arizona Health Sciences and Tech Launch Arizona.

Also, as we launch the Comprehensive Education Core, the BS in Medical Device Technology Development that will utilize the infrastructure to accommodate growth and provide students the support they need to be successful throughout their educational journeys.

Finally, and most importantly, there is an urgent need to provide educational pathways to students. The BS in Medical Device Technology Development will allow departments to leverage existing courses in novel ways and provide much needed enrollment opportunities.

With regards,

Karthik Kannan
Dean and Halle Chair in Leadership
Eller College of Management
University of Arizona

COLLEGE OF ENGINEERING
Office of the Dean
1209 E. 2nd Street, Room 100
Tucson, AZ 85721-0072

Office: 520-621-6595
engineering.arizona.edu

THE UNIVERSITY OF ARIZONA
College of Engineering

November 14, 2024

To: Dean Michael Abecassis, College of Medicine - Tucson

From: David W. Hahn, Craig M. Berge Dean, College of Engineering

Subject: Medical Device Technology Development

This memo is to express College of Engineering full support for your new proposed BS degree program Medical Device Technology Development (MDTD). Engineering looks forward to future collaborations and identification of synergy between the MDTD program and existing engineering programs, including Biomedical Engineering, Systems Engineering, and Electrical and Computer Engineering to name a few.

The University of Arizona Health Sciences

Office of the Senior Vice President for Health Sciences

Phoenix Campus
435 North 5th Street
Executive Suite
Phoenix, AZ 85004-2230

Tucson Campus
1670 E. Drachman
PO Box 210216
Tucson, AZ 85721-0216
Tel: (520) 626-1197
Fax: (520) 626-1460

February 23, 2024

Marvin Slepian, M.D.
Regents Professor of Medicine – Division of Cardiology
Regents Professor and Associate Department Head – Biomedical Engineering
University of Arizona College of Medicine – Tucson

Dear Marvin:

I am excited to hear about the proposed launch of a new Bachelor of Science in Medical Device Technology Development. The new degree will offer students additional opportunities within the health sciences and meets the needs of a rapidly growing industry. As with any expanding industry, educational pathways that can help students move into the field will be very valuable to employers and sought after by students.

Not only will this degree help grow overall enrollment in a new and dynamic field of study, it also positions graduates to meet the challenges of the future in health care technology. The forward-thinking curriculum will prepare students to enter a fast-changing landscape by providing them with the interprofessional perspective necessary to be successful. This interprofessional partnership between four existing UA colleges, the University of Arizona Health Sciences and Tech Launch Arizona creates a unique opportunity for students by leveraging existing courses and resources.

I strongly support the launch of this program as an addition to the offerings of the College of Medicine – Tucson where it will be well positioned with access to research, clinical and other medical faculty and professionals. The college's history of excellent academic support for students will be key in ensuring their success as this new program ramps up.

Sincerely,

Michael D. Dake, MD
Senior Vice President for Health Sciences
University of Arizona

THE UNIVERSITY OF ARIZONA
James E. Rogers College of Law

DEAN'S OFFICE
James E Rogers College of Law
1201 E Speedway Blvd
PO Box 210176
Tucson AZ 85721-0176

520-621-1498 / law.arizona.edu

November 9, 2024

Marvin Slepian, M.D.
Regents Professor of Medicine – Division of Cardiology
Regents Professor and Associate Department Head – Biomedical Engineering
University of Arizona College of Medicine – Tucson

Dear Marvin,

As Dean of the James E. Rogers College of Law, I strongly support the College of Medicine-Tucson proposal for a new Bachelor of Science in Medical Device Technology Development.

This new Bachelor of Science in Medical Device Technology Development degree will help grow the overall number of students coming to University of Arizona as well as those enrolling on-line. The proposed program aligns well with existing undergraduate courses, including several in our James E. Rogers College of Law Health Law & Policy Program that will be offered as part of the new degree. These courses, include:

LAW 480B: Data Privacy and Cybersecurity in Healthcare
LAW 478A: Legal & Regulatory Aspects for Healthcare Delivery
LAW 479B: Legal & Regulatory Fundamentals of Healthcare Business

There is an urgent need to provide educational pathways to students that leverage existing courses in novel ways and provide much needed enrollment opportunities. The new Bachelor of Science in Medical Device Technology Development degree addresses this need and offers a unique learning experience that will prepare future students for careers in this growing sector of the healthcare industry.

Sincerely,

Marc L. Miller
Dean and Ralph W. Bilby Professor of Law

OFFICE OF THE DEAN

McClelland Hall 417
1130 E. Helen Street
P.O. Box 210108
Tucson, AZ 85721-0108
Ofc: 520-621-2125
eller.arizona.edu

THE UNIVERSITY OF ARIZONA
Eller College of Management

March 1, 2024

Marvin Slepian, M.D.
Regents Professor of Medicine – Division of Cardiology
Regents Professor and Associate Department Head – Biomedical Engineering
University of Arizona College of Medicine – Tucson

Dear Marvin:

In my role as Dean of Eller College of Management, I am writing this letter in strong support of the College of Medicine-Tucson proposal for a new Bachelor of Science in Medical Device Technology Development.

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Also, as we launch the Comprehensive Education Core, the BS in Medical Device Technology Development that will utilize the infrastructure to accommodate growth and provide students the support they need to be successful throughout their educational journeys.

Finally, and most importantly, there is an urgent need to provide educational pathways to students. The BS in Medical Device Technology Development will allow departments to leverage existing courses in novel ways and provide much needed enrollment opportunities.

With regards,

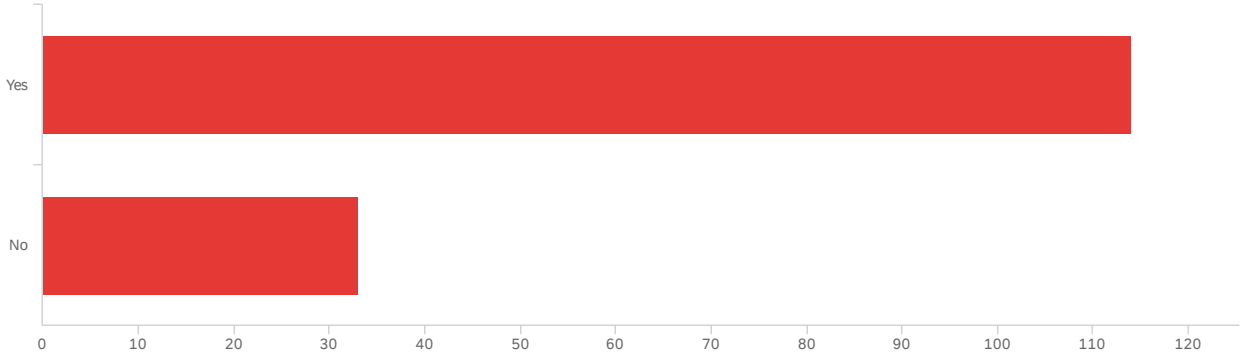
Karthik Kannan
Dean and Halle Chair in Leadership
Eller College of Management
University of Arizona

Default Report

Bachelor of Science Degree Program in Medical Device Technology Development (MDTD) Interest Survey

February 15, 2024 11:16 AM MST

Q1 - Do you have any interest in learning more about medical devices and how they are used, developed, marketed, sold, etc.?

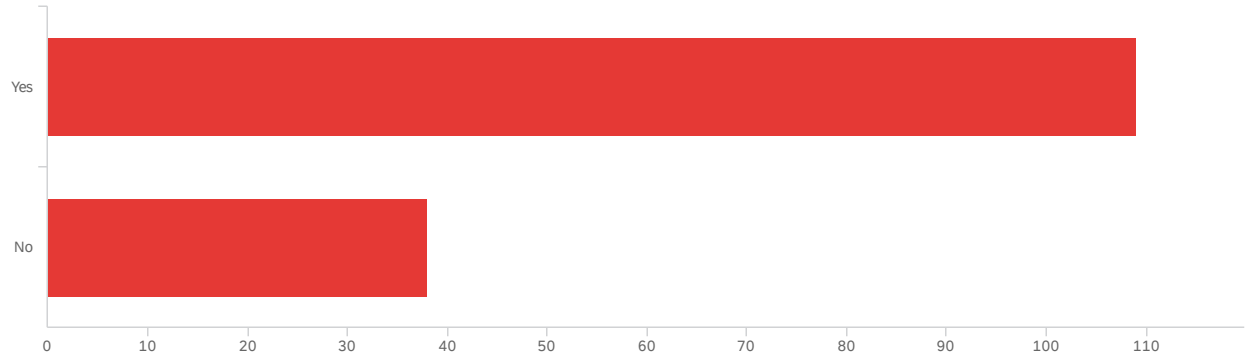


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Do you have any interest in learning more about medical devices and how they are used, developed, marketed, sold, etc.?	1.00	2.00	1.22	0.42	0.17	147

#	Field		Choice Count
1	Yes	77.55%	114
2	No	22.45%	33
			147

Showing rows 1 - 3 of 3

Q2 - Do you have any interest in learning more about pharma/drug technologies and biotech?

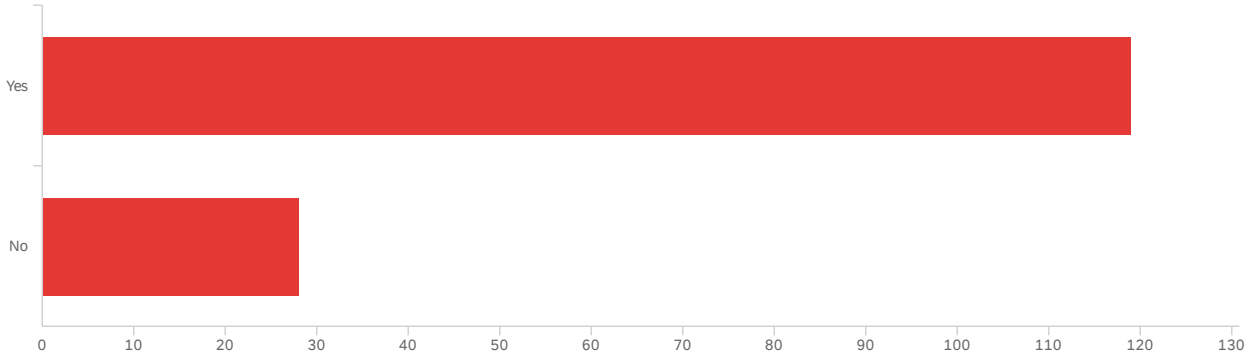


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Do you have any interest in learning more about pharma/drug technologies and biotech?	1.00	2.00	1.26	0.44	0.19	147

#	Field		Choice Count
1	Yes	74.15%	109
2	No	25.85%	38
			147

Showing rows 1 - 3 of 3

Q3 - If the College of Medicine offered courses on medical devices, pharma and biotech that were non-technical, with no advanced math requirement, would you register for the courses?

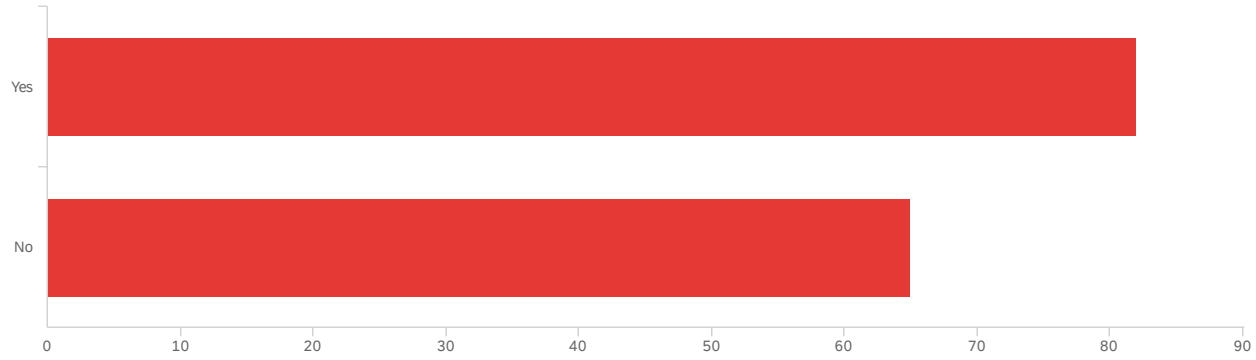


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	If the College of Medicine offered courses on medical devices, pharma and biotech that were non-technical, with no advanced math requirement, would you register for the courses?	1.00	2.00	1.19	0.39	0.15	147

#	Field		Choice Count
1	Yes	80.95%	119
2	No	19.05%	28
			147

Showing rows 1 - 3 of 3

Q5 - If a degree or a minor was available in medical device technology and development would you be interested?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	If a degree or a minor was available in medical device technology and development would you be interested?	1.00	2.00	1.44	0.50	0.25	147

#	Field		Choice Count
1	Yes	55.78%	82
2	No	44.22%	65
			147

Showing rows 1 - 3 of 3

Monday, December 9, 2024 at 11:22:40 Mountain Standard Time

Subject: RE: Classes for Proposed New Major
Date: Tuesday, October 22, 2024 at 1:59:14 PM Mountain Standard Time
From: Sorensen, Ronald Duane - (rdsorensen)
To: Phillips, Brandon - (phillipsb), Urquidez, Celina B - (celinau)
Attachments: image001.png, image002.png

Hello Brandon,

I've reached out to all the faculty teaching the courses you have listed in your email below. They are fine with having the courses listed as electives in the new undergraduate major in Medical Device Technology Development.

Thank you,

Ron

From: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Sent: Wednesday, October 2, 2024 1:54 PM
To: Sorensen, Ronald Duane - (rdsorensen) <rdsorensen@arizona.edu>; Urquidez, Celina B - (celinau) <celinau@arizona.edu>
Subject: Classes for Proposed New Major

Hi Ron and Celina,

I have been assisting with the proposal for a new undergraduate major in Medical Device Technology Development, and we have selected numerous courses to be included as emphasis electives. Some of these are from FCM. I was hoping you could let me know if FCM would approve of their use as emphasis electives in this new MDTD program.

The courses are:

- FCM 302 Clinical Health Disparities in Sexual and Gender Minority (SGM) Populations (3 units)
- FCM 402/502 Addressing Health Disparities through Interprofessional Clinical-Community Collaboration (3 units)

I know 302 and 402 have not been active recently, but if you think they will be offered in the future, we would still like to include them.

- FCM 424/524 Arts and Community Health Intercultural Perspectives and Applications Parts I-III (1-3 units)
- FCM 410/510 Substance Misuse in Maternal and Child Health Populations (3 units)
- FCM 496A Advancements in Substance Misuse Research and Clinical Care Seminar (2 units)
- FCM 498 Community Health Field Training Experience (2 units)

Please let me know if we can use these courses to help build the emphases. Feel free to reach out if you need more information. We are hoping to get your approval by the end of October because this proposal is moving on to next steps very soon.

Monday, December 9, 2024 at 11:24:32 Mountain Standard Time

Subject: Re: Classes for Proposed New Major
Date: Friday, October 18, 2024 at 12:41:25 PM Mountain Standard Time
From: Kiehlbaugh, Kasi - (kkiehlbaugh)
To: Phillips, Brandon - (phillipsb), Ehiri, John E - (jehiri), Embry, Danielle M - (dembry)
CC: Peters, Matt - (mwpeters)
Attachments: image003.png, image001.png, image002.png

Brandon,

I am writing to approve the use of HSD 401, HSD 410, and HSD 420 in the MDTD program. I would also like to recommend that you include our newly approved course, HSD 415, as well.

HSD 415: Design Visualization Practices for Health: From Speculations to Resolutions (3 units)
https://catalog.arizona.edu/courses/0434181

Warmly,
Kasi

Kasi M. Kiehlbaugh, PhD | she/her
pronunciation: "KAY-see KEEL-bah"
Director, Health Sciences Design
University of Arizona Health Sciences, HSIB 615
Assistant Professor of Practice, Biomedical Engineering
Executive Committee Chair, Vertically Integrated Projects
520-621-0539 (office) | 520-261-1553 (cell) | 306604 (Zoom Phone) | kkiehlbaugh@arizona.edu

---

From: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Sent: Thursday, October 3, 2024 1:06 PM
To: Ehiri, John E - (jehiri) <jehiri@arizona.edu>; Embry, Danielle M - (dembry) <dembry@arizona.edu>
Cc: Kiehlbaugh, Kasi - (kkiehlbaugh) <kkiehlbaugh@arizona.edu>; Peters, Matt - (mwpeters) <mwpeters@arizona.edu>
Subject: Re: Classes for Proposed New Major

Thank you, John!

THE UNIVERSITY OF ARIZONA

Brandon Phillips
Program Coordinator, Senior
Bachelor of Science in Medicine
College of Medicine
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From: Ehiri, John E - (jehiri) <jehiri@arizona.edu>
Date: Thursday, October 3, 2024 at 1:03 PM
To: Embry, Danielle M - (dembry) <dembry@arizona.edu>, Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Cc: Kiehlbaugh, Kasi - (kkiehlbaugh) <kkiehlbaugh@arizona.edu>, Peters, Matt - (mwpeters) <mwpeters@arizona.edu>
Subject: RE: Classes for Proposed New Major

Hi Brandon,

I approve the inclusion of PHP 205, PHPM 310, and HPS 433 in your new MDTD program.

Best wishes,
John

THE UNIVERSITY OF ARIZONA

John Ehiri, PhD
Professor
Senior Associate Dean for Academic and Faculty Affairs
Mel and Enid Zuckerman College of Public Health
THE UNIVERSITY OF ARIZONA
Roy P. Drachman Hall, A317H
1295 N Martin Ave | Tucson, AZ 85721
Office: 520-626-1355
jehiri@arizona.edu
publichealth.arizona.edu

From: Embry, Danielle M - (dembry) <dembry@arizona.edu>
Sent: Thursday, October 3, 2024 10:03 AM
To: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Cc: Ehiri, John E - (jehiri) <jehiri@arizona.edu>; Kiehlbaugh, Kasi - (kkiehlbaugh) <kkiehlbaugh@arizona.edu>; Peters, Matt - (mwpeters) <mwpeters@arizona.edu>
Subject: RE: Classes for Proposed New Major

Good morning Brandon.

Thanks for reaching out. Sounds like an interesting new major! I am copying our Sr. Associate Dean for Academic Affairs, Dr. John Ehiri, here for approval to list PHP 205, PHPM 310 and HPS 433 in your new MDTD program.

The HSD classes will soon be transferred to the College of Health Sciences. I'm looping in the Director of Health Sciences Design, Dr. Kasi Kiehlbaugh, for approval to list HSD 401, HSD 410, and HSD 420.

Best,
Danielle

From: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Sent: Wednesday, October 2, 2024 1:48 PM
To: Embry, Danielle M - (dembry) <dembry@arizona.edu>
Subject: Classes for Proposed New Major

Hi Danielle,

I have been assisting with the proposal for a new undergraduate major in Medical Device Technology Development, and we have selected numerous courses to be included as emphasis electives. Some of these are in your purview. I was hoping you could let me know if these programs would approve of their use as emphasis electives in this new MDTD program.

The courses are:

- PHP 205 Fundamentals of Telehealth (3 units)
- HSD 401 Design for Health Workshop: Addressing Human Health Challenges with Design Thinking (Gen Ed Building Connections) (3 units)
- HSD 410 Device Design in the Health Sciences: Developing Tools for Health Care Solutions using Design Thinking (3 units)
- HSD 420 Healthy Design Practices: From the Makerspace to the Community (3 units)
- PHPM 310 Health Care in the U.S. (3 units)
- HPS 433 Global Health (3 units)

Please let me know if we can use these courses to help build the emphases. Feel free to reach out if you need more information. We are hoping to get approval by the end of October because this proposal is moving on to next steps very soon.

Thank you,

THE UNIVERSITY OF ARIZONA

Brandon Phillips
Program Coordinator, Senior
Bachelor of Science in Medicine
College of Medicine
THE UNIVERSITY OF ARIZONA

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Subject: Re: Classes for Proposed New Major
Date: Thursday, October 3, 2024 at 4:58:26 PM Mountain Standard Time
From: Wilson, Diana K - (dwilson)
To: Phillips, Brandon - (phillipsb)
Attachments: image001.png, image002.png

Hi Brandon,

Thanks for reaching out. I talked with our undergrad faculty:

BME 295C is open to all majors so that one is fine.

BME 486 - Dr. Kim said that one can work
BME 477 - Dr. Subbian said no on that one due to needing higher level engr/stats + coding skills

Would you be able to send a copy of the four year plan going into the proposal when you get a chance? When does this go up for a vote with Faculty Senate and ABOR?

Best, Diana

Diana Wilson, M.A. *She, her, hers*
Senior Academic Advisor
Engineering Bldg., 112D
520-621-5420
Please use this link to make an appointment:
https://trellis.arizona.edu/solutions/trellis-advise
Zoom: https://arizona.zoom.us/my/bmediana

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[bme.engineering.arizona.edu]bme.engineering.arizona.edu

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This too shall pass

From: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Sent: Wednesday, October 2, 2024 1:58 PM
To: Wilson, Diana K - (dwilson) <dwilson@arizona.edu>
Subject: Classes for Proposed New Major

Hi Diana,

I have been assisting with the proposal for a new undergraduate major in Medical Device Technology Development, and we have selected numerous courses to be included as emphasis electives. Some of these are from BME. I was hoping you could let me know if BME would approve of their use as emphasis electives in this new MDTD program.

The courses are:

- BME 295C Challenges in Biomedical Engineering (1 unit)
- BME 477 Introduction to Bioinformatics (*instru consent rqd*) (3 units)
- BME 486 Biomaterial-Tissue Interactions (3 units)

Please let me know if we can use these courses to help build the emphases. Feel free to reach out if you need more information. We are hoping to get your approval by the end of October because this proposal is moving on to next steps very soon.

Thank you,

THE UNIVERSITY OF ARIZONA

Brandon Phillips
Program Coordinator, Senior
Bachelor of Science in Medicine
College of Medicine
THE UNIVERSITY OF ARIZONA

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Subject: Re: PHCL Courses in MDTD
Date: Wednesday, December 11, 2024 at 10:16:51 AM Mountain Standard Time
From: Phillips, Brandon - (phillipsb)
To: Vanderah, Todd W - (vanderah)
Attachments: image001.png, image002.png, image003.png, image004.png

Yes, that's the PHCL 386 in the core.

THE UNIVERSITY OF ARIZONA

Brandon Phillips
Program Coordinator, Senior
Bachelor of Science in Medicine
College of Medicine
THE UNIVERSITY OF ARIZONA

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From: Vanderah, Todd W - (vanderah) <vanderah@arizona.edu>
Date: Wednesday, December 11, 2024 at 10:16 AM
To: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Subject: Re: PHCL Courses in MDTD

Hi Brandon,

Yes, all good for the MDTD program
We also want to make sure Doug and Rakhi's course is available - I forget their number but is is a PHCL course.

Todd

Todd W. Vanderah
Regents Professor and Head
Department of Pharmacology

Co-Director of the MD/PhD Program
University of Arizona, COM-T
Director of the Comprehensive Center for Pain and Addiction
Assistant Vice President, Research and Innovation with the Global MD Program
University of Arizona Health Sciences
http://painandaddiction.arizona.edu/

From: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Sent: Wednesday, December 11, 2024 10:13 AM
To: Vanderah, Todd W - (vanderah) <vanderah@arizona.edu>
Subject: PHCL Courses in MDTD

Hi Todd,

I wanted to reach out to get your approval to use the following PHCL courses in the new proposed MDTD program:
PHCL 386 Intro to Tech Transfer in Medicine – proposed as a core major requirement
PHCL 412 Intro to Pharmacology – emphasis course
PHCL 460 Designing Drugs – emphasis course
PHCL 430 Pain – emphasis course
PHCL 444 Human Neurobiology Basics – emphasis course

Thanks,

THE UNIVERSITY OF ARIZONA

Brandon Phillips
Program Coordinator, Senior
Bachelor of Science in Medicine
College of Medicine
THE UNIVERSITY OF ARIZONA

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From: Hingle, Melanie D - (hinglem) <hinglem@arizona.edu>
Date: Thursday, December 12, 2024 at 9:27 AM
To: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Cc: Wilund, Kenneth R - (kwilund) <kwilund@arizona.edu>
Subject: Re: MDTD Emphasis Courses

Hello Brandon

Thanks for your inquiry.

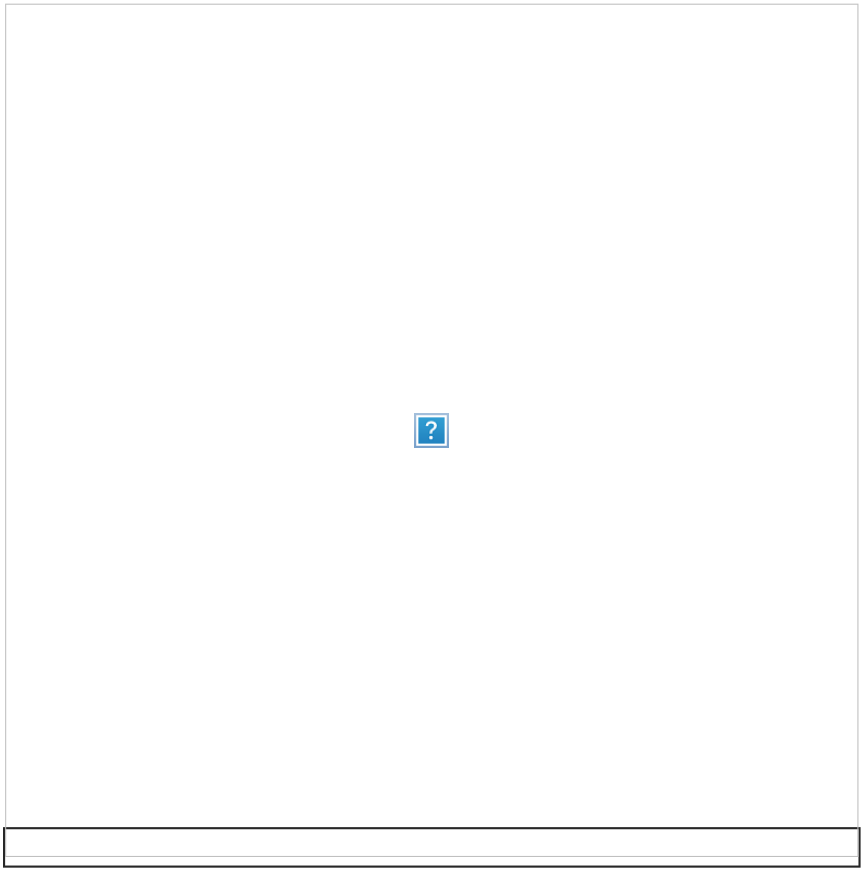
NSC 310 is a popular gen ed course that is offered regularly, although right now, only online.
NSC 275 was part of the Precision Nutrition degree and is not currently being offered. There has been some initial discussion about adding 275 back to the schedule for various reasons, including the fact that it was included as part of the core for the NSW pre-health degree. However, with the ongoing financial issues we are experiencing, it is not a high priority since we are having trouble getting our regular classes covered.

Melanie Hingle, PhD, MPH, RDN
Professor
Associate Director, School of Nutritional Sciences and Wellness
College of Agriculture, Life and Environmental Sciences
THE UNIVERSITY OF ARIZONA

Shantz Bldg, Room 328

Tucson, AZ 85721
Office: 520-621-3087
Email: hinglem@arizona.edu

Co-Editor-in-Chief, ***International Journal of Behavioral Nutrition & Physical Activity***



Book time to meet with me

From: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Sent: Monday, December 9, 2024 11:34 AM
To: Hingle, Melanie D - (hinglem) <hinglem@arizona.edu>
Cc: Wilund, Kenneth R - (kwilund) <kwilund@arizona.edu>
Subject: Re: MDTD Emphasis Courses

Hi Melanie and Ken,

I wanted to follow up about the use of these two courses as emphasis electives for the proposed Medical Device Technology Development major:

- NSC 275 Fundamentals of Precision Nutrition and Wellness

- NSC 310 Principles of Human Nutrition in Health and Disease

We are in the process of getting this proposal submitted, and I need a record of support from your department in our use of these courses.
Thank you,

Brandon Phillips
Program Coordinator, Senior
Bachelor of Science in Medicine
College of Medicine
THE UNIVERSITY OF ARIZONA

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From: Hingle, Melanie D - (hinglem) <hinglem@arizona.edu>
Date: Thursday, October 10, 2024 at 1:32 PM
To: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Cc: Wilund, Kenneth R - (kwilund) <kwilund@arizona.edu>
Subject: MDTD Emphasis Courses

Hi Brandon
I received this note (below) and I wanted to let you know that Scott Going retired in June 2023, and Ken Wilund, cc'd on this email, is now our School Director. (I think Ken has met your Director). I am coordinating the undergraduate programs in our School, so between Ken and me, we can get your questions answered. Please do reach out with any other questions, and if there is a request for courses to be made available to your students, definitely keep us in the loop so that we can be sure to schedule and staff accordingly.
THank you!
Melanie

Melanie Hingle, PhD, MPH, RDN
Professor

School of Nutritional Sciences & Wellness
THE UNIVERSITY OF ARIZONA

Shantz Building, Room 309
1177 E. 4th Street, Tucson AZ 85721
vamullins@arizona.edu

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From: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Sent: Wednesday, October 9, 2024 2:39 PM
To: Mendoza, Michelle - (mnmendoz) <mnmendoz@arizona.edu>
Cc: Mullins, Veronica Anne - (vamullins) <vamullins@arizona.edu>; Jackson, Kelly A - (kjackson) <kjackson@arizona.edu>; Going, Scott B - (going) <going@arizona.edu>
Subject: MDTD Emphasis Courses

Hi Michelle,

The last time I reached out to you it was about BS Medicine emphasis courses. Recently, I have been assisting with the proposal for a new undergraduate major in Medical Device Technology Development, and we have selected numerous courses to be included as emphasis electives. Two of these are from NSC. I was hoping you could let me know if the department would approve of their use as emphasis electives in this new MDTD program.

The courses are:

- NSC 275 Fundamentals of Precision Nutrition and Wellness
- NSC 310 Principles of Human Nutrition in Health and Disease

Please let me know if we can use these courses to help build the emphases. Feel free to reach out if you

need more information. We are hoping to get your response by the end of October because this proposal is moving on to next steps very soon.

Thank you,

Brandon Phillips
Program Coordinator, Senior
Bachelor of Science in Medicine
College of Medicine
THE UNIVERSITY OF ARIZONA

Arizona Health Sciences Center
1119
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Working together to expand human potential, explore new horizons and enrich life for all.

Integrity • Compassion • Exploration
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From: Mendoza, Michelle - (mnmendoz) <mnmendoz@arizona.edu>
Date: Wednesday, May 31, 2023 at 4:09 PM
To: Phillips, Brandon - (phillipsb) <phillipsb@arizona.edu>
Cc: Mullins, Ronnie Anne - (vamullins) <vamullins@arizona.edu>, Jackson, Kelly A - (kjackson) <kjackson@arizona.edu>, Going, Scott B - (going) <going@arizona.edu>
Subject: RE: BSM Emphasis Courses

Hi Brandon,

Thank you again for your interest in our courses! I appreciate your patience while I consulted with our faculty regarding your requests. We are okay with you listing NSC 101/170C1 and NSC 310 as options for the students. We are also okay offering NSC 315 and NSC 320, but only the online sections due to course capacity.

If you have any additional questions or require any formal agreement, I've included Ronnie Mullins (NHP Program Coordinator), Kelly Jackson (Undergrad Program Director), and Scott Going (School Director) on this thread.

Sincerely,

Michelle Mendoza, MA, RDN
Director of Student Nutrition Advising Center (SNAC)

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OFFICE OF THE DEAN

February 20, 2024

Marvin Slepian, M.D.
Regents Professor of Medicine – Division of Cardiology
Regents Professor and Associate Department Head – Biomedical Engineering
University of Arizona College of Medicine – Tucson

Dear Marvin:

In our roles as Dean and Vice Dean of Education, we write in strong support of the College of Medicine-Tucson proposal for a new Bachelor of Science in Medical Device Technology Development.

This new Bachelor of Science in Medical Device Technology Development degree will help grow the overall number of students coming to University of Arizona as well as those enrolling on-line. In addition, several Colleges/Departments/Center faculty members are leaders in their fields and are uniquely qualified to contribute to the program. The proposed program emanates from a partnership between the College of Engineering, James E. Rogers College of Law, Eller College of Management, College of Medicine Tucson, University of Arizona Health Sciences and Tech Launch Arizona.

Also, as we launch the Comprehensive Education Core, the BS in Medical Device Technology Development that will utilize the infrastructure to accommodate growth and provide students the support they need to be successful throughout their educational journeys.

Finally, and most importantly, there is an urgent need to provide educational pathways to students. The BS in Medical Device Technology Development will allow departments to leverage existing courses in novel ways and provide much needed enrollment opportunities.

Sincerely,

Michael M. I. Abecassis, MD, MBA
Iovanna C. Lopez Dean, College of Medicine - Tucson
Professor, Departments of Surgery and Immunobiology

Kevin F. Moynahan, MD, FACP
Vice Dean, Education
Professor, Department of Medicine

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February 23, 2024

Marvin Slepian, M.D.
Regents Professor of Medicine – Division of Cardiology
Regents Professor and Associate Department Head – Biomedical Engineering
University of Arizona College of Medicine – Tucson

Dear Marvin:

I am excited to hear about the proposed launch of a new Bachelor of Science in Medical Device Technology Development. The new degree will offer students additional opportunities within the health sciences and meets the needs of a rapidly growing industry. As with any expanding industry, educational pathways that can help students move into the field will be very valuable to employers and sought after by students.

Not only will this degree help grow overall enrollment in a new and dynamic field of study, it also positions graduates to meet the challenges of the future in health care technology. The forward-thinking curriculum will prepare students to enter a fast-changing landscape by providing them with the interprofessional perspective necessary to be successful. This interprofessional partnership between four existing UA colleges, the University of Arizona Health Sciences and Tech Launch Arizona creates a unique opportunity for students by leveraging existing courses and resources.

I strongly support the launch of this program as an addition to the offerings of the College of Medicine – Tucson where it will be well positioned with access to research, clinical and other medical faculty and professionals. The college's history of excellent academic support for students will be key in ensuring their success as this new program ramps up.

Sincerely,

Michael D. Dake, MD
Senior Vice President for Health Sciences
University of Arizona