Utah System of Higher Education
New Academic Program Proposal
Cover/Signature Page - Full Template

Institution Submitting Request:	**University of Utah**
Proposed Program Title:	**Master of Science in Cardiovascular Perfusion**
Sponsoring School, College, or Division:	**University of Utah School of Medicine**
Sponsoring Academic Department(s) or Unit(s):	**University of Utah Division of Cardiothoracic Surgery**
Classification of Instructional Program Code[1] :	**51.0906**
Min/Max Credit Hours Required to Earn Degree:	**82 / 82**
Proposed Beginning Term[2]:	**Summer 2020**
Institutional Board of Trustees' Approval Date:	

Program Type (check all that apply):

☐ (AAS)	Associate of Applied Science Degree
☐ (AA)	Associate of Arts Degree
☐ (AS)	Associate of Science Degree
☐	Specialized Associate Degree (specify award type[3]:)
☐	Other (specify award type[3]:)
☐ (BA)	Bachelor of Arts Degree
☐ (BS)	Bachelor of Science Degree
☐	Professional Bachelor Degree (specify award type[3]:)
☐	Other (specify award type[3]:)
☐ (MA)	Master of Arts Degree
☒ (MS)	Master of Science Degree
☐	Professional Master Degree (specify award type[3]:)
☐	Other (specify award type[3]:)
☐	Doctoral Degree (specify award type[3]:)
☐	K-12 School Personnel Program
☐	Out of Service Area Delivery Program

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

Please type your first and last name _____ Date:

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

[1] For CIP code classifications, please see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55
[2] "Proposed Beginning Term" refers to first term after Regent approval that students may declare this program.
[3] Please indicate award such as APE, BFA, MBA, MEd, EdD, JD

Utah System of Higher Education
Program Description - Full Template

Section I: The Request

University of Utah requests approval to offer the following Master's degree(s): Master of Science in Cardiovascular Perfusion effective Summer 2020. This program was approved by the institional Board of Trustees on .

Section II: Program Proposal

Program Description

Present a complete, formal program description.

The Master of Science in Cardiovascular Perfusion (MSCP) is a proposed graduate degree program housed in the Division of Cardiothoracic (CT) Surgery within the School of Medicine. The MSCP is designed to educate students and prepare them with the knowledge, skills, and expertise necessary to graduate as licensed cardiovascular perfusionists. These individuals are vital members of the cardiovascular surgical team as they are responsible for running the heart-lung (cardiopulmonary bypass) machine and are heavily relied on by surgeons. During surgery, they utilize the appropriate equipment to maintain blood flow to the body's tissues and regulate levels of oxygen and carbon dioxide in the blood. Perfusionists are also responsible for measuring selected laboratory values and monitoring circulation. They also administer medicines through the cardiopulmonary bypass circuit, among other responsibilities in the surgical setting. Our program graduates will meet the requirements necessary to succeed in a field where surgical techniques, cardiopulmonary bypass techniques, and new technologies are constantly changing the way we practice medicine.

The MSCP program is intended to attract current allied health professionals, recent baccalaureate graduates, and qualified individuals to learn the advanced perfusion techniques needed for successful careers in cardiovascular surgery. The MSCP is a 24-month (6 semester) post-baccalaureate degree that begins with three semesters (48 credit hours) of full time didactic and laboratory education, with students also doing clinical observations at the University of Utah hospital. The didactic portion of the curriculum for this program includes: Master's level anatomy, physiology, pharmacology, perfusion technology, laboratory, research methods, and a masters project. The last three semesters (34 credit hours) will comprise of a clinical phase which includes full-time clinical rotations under the direct supervision of a preceptor at the University of Utah, Primary Children's, and other surrounding Utah and Intermountain West hospitals. All program requirements are aligned with the external accrediting body for the field which falls under the Commission on Accreditation of Allied Health Education Programs who has an Accreditation Committee on Perfusion Education. The MSCP will be seeking external accreditation, as is standard for all educational programs in the field.

Consistency with Institutional Mission

Explain how the program is consistent with the institution's Regents-approved mission, roles, and goals. Institutional mission and roles may be found at higheredutah.org/policies/policyr312/ .

The mission of the MSCP program is to graduate highly trained perfusionists who are competent, compassionate, and integral members of the cardiac surgery team. The mission of the Utah System of Higher Education (USHE) is to provide high quality academic, professional, and applied technology learning opportunities designed to advance the intellectual, cultural, social and economic well-being of the state of Utah and its citizens. Further, the USHE's Mission Statement discusses preparing a productive work force for a global marketplace. The MSCP program's curriculum and expectations align with that mission. By creating this degree program, we are giving students in our state an opportunity to pursue higher education in this field, as well developing the workforce to meet the growing needs for licensed cardiovascular perfusionists at our hospitals here in Utah, the Intermountain West, and beyond. The objectives of the MSCP are aligned with ongoing initiatives at the University of Utah and University of Utah Health that are focused on improving health care quality, achieving excellence in patient care, education, and research. Using evidence-based medicine, this program will equip students with the knowledge, skills, and experience to work cooperatively and safely with a healthcare team to perform perfusion techniques to ensure excellence in patient care.

Section III: Needs Assessment

Program Rationale

Describe the institutional procedures used to arrive at a decision to offer the program. Briefly indicate why such a program should be initiated. State how the institution and the USHE benefit by offering the proposed program.

This proposal is the product of several years of discussion and research around the increasing need for licensed perfusionists to fulfill the constantly increasing number of job openings in the state of Utah. The need for perfusionists has been increasing over the last few decades, but the programs graduating new certified perfusionists have not been able to keep up with the growing demand.

There are currently 16 perfusion programs in the United States with only 160 students graduating annually, only two of these institutions are in the Western United States. With 250+ job openings currently posted, there is a demonstrated lack of trained workforce in this field. Data also suggests that a large number of perfusionists in the country are 55 years of age and older (29%). See Appendix II for the article, "Results of the 2015 Perfusionist Salary Study" published in the Journal of ExtraCorporeal Technology. Due to the aging population of those currently practicing in the field, it is noted that the perfusion profession will lose over 1,000 perfusionists over the next decade. The need for additional perfusion programs to help with training highly qualified professionals to replace the retiring members of the workforce is essential.

The development and initiation of a MSCP program within the School of Medicine will help meet the demand of perfusionist openings in the country, provide more highly trained professionals to increase the safety and care of our patients, and to better provide increased opportunities for individuals to study perfusion in Utah and in the Western United States.

This program was voted upon by the Department of Surgery faculty via electronic vote on April 4, 2019. The results showed 63 in favor, 0 opposed, and 8 abstentions. This vote demonstrates the large support from the Department of Surgery faculty for the creation of this program.

The MSCP program was presented to the School of Medicine Executive Committee on April 15, 2019 who unanimously voted to approve. This proposal was approved by the Graduate Council after presenting on April 29, 2019.

Our program proposal will also support the governor's current vision to ensure that 66% of Utah residents have a postsecondary degree or certificate. We will do this by increasing the number of graduate degree options in Utah and thus increasing the number of opportunities available. This in turn will help to ensure a well-educated citizenry and workforce that will lead to greater economic prosperity and a better quality of life for all of Utah.

Labor Market Demand

Provide local, state, and/or national labor market data that speak to the need for this program. Occupational demand, wage, and number of annual openings information may be found at sources such as Utah DWS Occupation Information Data Viewer (jobs.utah.gov/jsp/wi/utalmis/gotoOccinfo.do) and the Occupation Outlook Handbook (www.bls.gov/oco).

On the national level, there are currently 250 job openings for perfusionists listed on Indeed.com. This number has remained steady for the past several years. Of the current openings, 232 of these jobs are full-time and 18 are part-time/per diem. In the State of Utah, there are currently four job openings, three of which have been unfilled for over a year. All four openings are in Salt Lake City. Three of these are for full time perfusionists and one per diem. With only 160 perfusionists graduating each year in the entire United States, graduates are in high demand and without the training and clinical experience being done in-state, it is difficult to attract graduates.

A national study on perfusionist salaries was done by Doreen M. Lewis, Steven Dove, and Ralph Jordan in 2015. This article was published in the 2016 Journal of ExtraCorporeal Technology. The results showed an average compensation of $127,600 a year with most receiving full-time benefits through their different employers (Appendix II)). In that same study, of all respondents to the survey, 29% of the perfusionists indicated that they will be retiring within the next decade. This is another large indicator that new perfusion training programs are needed to fulfill the demand of the retiring professionals from the baby boomer generation.

According to the U.S. Bureau of Labor Statistics, cardiovascular surgery professions are expected to experience significant job growth over the next decade. Many health professional websites describing the perfusionist profession also indicate that the job outlook is a very promising (See Appendix III) and stable profession (See Appendix IV).

Student Demand

Provide evidence of student interest and demand that supports potential program enrollment. Use Appendix D to project five years' enrollments and graduates. Note: If the proposed program is an expansion of an existing program, present several years enrollment trends by headcount and/or by student credit hours that justify expansion.

During the development of this proposal, eight individuals from the University of Utah Health and five from the State of Utah (outside of the University of Utah) approached affiliated faculty to show sincere interest in applying. After this initial, informal feedback, we conducted a survey to determine interest from some of our partner universities in the state (University of Utah, Brigham Young University, Utah State University, and Weber State University). This survey was sent to the pre-health advisors for distribution to their student bodies. As of mid-March, there were 136 respondents. 93% indicated they would be interested in applying to the proposed program. Of the 136 respondents, 61% were female and 39% were male with a large varying age gap (with majority of respondents falling within the 18-34 age bracket). These statistics are extremely encouraging, showing a wide range of individuals from across the State of Utah who are interesting in applying.

Similar Programs

Are similar programs offered elsewhere in the USHE, the state, or Intermountain Region? If yes, identify the existing program(s) and cite justifications for why the Regents should approve another program of this type. How does the proposed program differ from or compliment similar program(s)?

There are no similar programs offered in the USHE, the state of Utah, or the Intermountain Region. This would be the first program of its kind in the state of Utah and only the third program in the Western United States. Within the Pacific 12 Conference there is only one other program at the University of Arizona.

Collaboration with and Impact on Other USHE Institutions

Indicate if the program will be delivered outside of designated service area; provide justification. Service areas are defined in higheredutah.org/policies/policyr315/ . Assess the impact the new program will have on other USHE institutions. Describe any discussions with other institutions pertaining to this program. Include any collaborative efforts that may have been proposed.

As mentioned in the Student Demand Section, the largest impact that the MSCP program will have on other USHE institutions will be providing their undergraduate students with an option to remain in-state for their graduate education. Students who major in pre-health disciplines will have the pre-requisites needed to apply directly into the MSCP program upon graduation.

Within the School of Medicine, we will be collaborating closely with the Physician Assistant (PA) Program which has similar introductory coursework and a similar structure. Our MSCP students will be taught anatomy, physiology, and pharmacology by the faculty and staff of the PA program during their first summer semester. By utilizing these three courses currently taught in our highly ranked PA program, we are eliminating duplication of coursework and streamlining the new didactic coursework being added to the University of Utah's overall course catalog. Dr. Trenton Honda, Division Chief of the Physician Assistant Studies Program, has been supportive of our efforts to create the MSCP program and is committed to continued collaboration (See Appendix I: Letters of Support). This program will help retain Utah graduates by giving them another graduate studies program to choose from within the state.

This proposed program is the only one of its kind in Utah and will be a viable option for graduating baccalaureates to choose from, rather than leaving the state for a similar program.

External Review and Accreditation

Indicate whether external consultants or, for a career and technical education program, program advisory committee were involved in the development of the proposed program. List the members of the external consultants or advisory committee and briefly describe their activities. If the program will seek special professional accreditation, project anticipated costs and a date for accreditation review.

The University of Utah MSCP program leadership will be governed by two committees, an Internal Advisory Board and an External Advisory Board, and the external accrediting body. Many individuals have been consulted during the creation of this proposal and have committed to be a part of our programmatic governance.

Program Leadership

Dr. Craig Selzman, MD (University of Utah School of Medicine, Chief, Division of Cardiothoracic Surgery, Professor of Surgery, Cardiothoracic Surgeon, MSCP Chief Medical Advisor)

Kirk Bingham, MS, CCP (University of Utah School of Medicine, Division of Cardiothoracic Surgery, Cardiovascular Perfusionist, MSCP Program Director/Coordinator)

Heather Clark, RN, MBA (University of Utah School of Medicine, Division of Cardiothoracic Surgery, Division Director)

Internal Advisory Board

Dr. Trenton Honda, PhD, MMS, PA-C (Chief, University of Utah Division of Physician Assistant Studies, Associate Professor (Lecturer))

Dr. Natalie Silverton, MD (University of Utah, Department of Anesthesiology, Assistant Professor (Clinical), Anesthesiologist)

Christopher Blaylock, MS, CCP (University of Utah School of Medicine, Division of Cardiothoracic Surgery, Lead Cardiovascular Perfusionist)

Brandon Tomacek, MS, CCP (University of Utah School of Medicine, Division of Cardiothoracic Surgery, Cardiovascular Perfusionist)

Jacob Wimmer, MS, CCP (University of Utah School of Medicine, Division of Cardiothoracic Surgery, Cardiovascular Perfusionist)

Collette Wixom-Call, MPA (University of Utah, Senior Director of Advancement for Cardiovascular Initiatives)

Robert Bowers, CCP, FPP (Primary Children's Hospital, Chief Pediatric Perfusionist, Clinical Manager Pediatric Perfusion)

Paul Matlin, MS, MBA, CCP (Salt Lake City Veteran Affairs Hospital, Lead Perfusionist)

External Advisory Board

Gregory Kitchen, MHA, MS, CCP (Washington Hospital Center, Director of Perfusion Services, Cardiovascular Perfusionist)

Shane Froebe, BS, CCP (Intermountain Medical Center, Senior Cardiovascular Perfusionist)

The Internal Advisory Board (IAB) will meet quarterly to discuss the initial roll out of the program as well as monitor its progress. We anticipate that the members of our IAB will participate in programmatic committees such as the Admissions Committee and the Curriculum Committee. We anticipate that after the first three years of the program, the frequency of meetings will be reduced to twice a year.

The External Advisory Board will initially meet twice a year to oversee and make suggestions to programmatic leadership about progress as well as to forecast the ongoing development of the MSCP program. The external advisory board is comprised of experts in perfusion from partner and peer institutions and have a valuable bank of knowledge that will assist in the program, through its continuous stages of development, implementation, and steady state. As the program develops, we anticipate identifying at least two additional members to join the EAB who can provide commentary from the patient and community perspective.

The University of Utah's Master of Science in Cardiovascular Perfusion will seek professional accreditation through the Commission on Accreditation of Allied Health Education Programs upon recommendation of the Accreditation Committee-Perfusion Education. The optional candidacy status cost is $3,000 and the initial accreditation status is $4,000 with an annual fee of $1,750 for continuing accreditation. Lastly, there is a $100 clinical site recognition application fee assessed per site. The timeline to seek accreditation is dictated by the external accrediting body. Our initial application will be submitted in December 2020 with ongoing evaluation and documentation requests through May 2021. The accrediting body will then review the application and decide by May 2022 whether the program will be nationally accredited.

Section IV: Program Details

Graduation Standards and Number of Credits

Provide graduation standards. Provide justification if number of credit or clock hours exceeds credit limit for this program type described in R401-3.11, which can be found at higheredutah.org/policies/R401.

The MSCP program requires students to successfully complete all 82 credit hours to graduate. All didactic coursework will be upper division classes consisting of: anatomy, physiology, pharmacology, perfusion technology, research, clinical observations & lectureships, mechanical circulatory support, risk management, interprofessional health care, laboratories, and clinical rotations. Students are required to maintain full-time enrollment through all 6 semesters. All students must also complete a masters project that will be guided by their assigned faculty advisor. Students must complete the program with a 3.0 or higher without failing any of the courses throughout the two-year degree. Students must also show high competency in the following:

- Safely operate extracorporeal circulation equipment and various cardiac assist devices
- Safely administer blood products, anesthetic agents, and all medications needed for extracorporeal bypass
- Monitor, diagnose, and repair patient hemodynamics
- Follow all ethical and legal standards
- Complete and accurate documentation of each perfusion case
- Meet eligibility to sit for and pass the certification examination of the American Board of Cardiovascular Perfusion
- Be competent in basic research and statistical methods

Due to the rigorous requirements of the external accrediting body, all 82 credits are needed to prepare students for the American Board of Cardiovascular Perfusionists certification exams. In the development of this proposal, programs from around the country were researched to determine their credit and graduation requirements. A selection of those master's program required credits are listed below:

-Medical University of South Carolina: Credits: 87
-Midwestern University: Credits: 103.5
-Milwaukee School of Engineering: Credits: 66
-University of Nebraska Medical Center: Credits: 80
-RUSH University: Credits: 78
-Vanderbilt University: Credits: 96

Many master's level perfusion programs vary in the number of required upper division credit hours required to graduate. Though credits vary, tuition rates remain relatively standard across each university. Most programs are also 21-24 months in length regardless of credits required showing that credit hour totals alone may not truly reflect the amount of time required to complete the offered coursework. See Appendix V for a more comprehensive table of peer institutions credits, length of program and tuition fees.

Admission Requirements

List admission requirements specific to the proposed program.

Applicants will submit materials using ApplyYourself, the application platform utilized by the graduate school ($55 for Domestic Students $65 for International Students).

Eligibility requirements for admissions to the MSCP are outlined below:

- Completion of a bachelor's level or higher degree from a regionally accredited college or university
- Minimum cumulative GPA and science GPA of 3.0 on a scale of 4.00
- Three letters of recommendation (Letters can be from any person who can attest to the applicant's capacity and potential for graduate studies)
- Completion of the required prerequisite courses at a regionally accredited college or university. All prerequisites must be completed with a C or better. Grades of C- are not acceptable for any prerequisite courses
- Prerequisite Courses Required:
    - Anatomy 3 credits (U of U BIOL 2325)
    - Physiology 3 credits (U of U BIOL 2420)
    - Biochemistry 3 credits (U of U BIOL 3510)
    - Physics 3 credits (U of U PHYS 2010)
    - Biology with lab 8 credit hours (U of U BIOL 1210/BIOL 2020)
    - General Chemistry (inorganic with lab) 4 credit hours (U of U CHEM 1210)
    - College Algebra or higher 6 credit hours (U of U MATH 1050/MATH 1060)
    - English 6 credit hours (U of U WRTG 2010 and one additional course)
    - *Social and Behavior Sciences (sociology, psychology, anthropology, etc.) 6 credit hours*
- Completion of the program's interview process
- Passage of the University of Utah criminal background check and drug screenings
- GRE exam not required

For competitive admissions, the MSCP program highly recommends:

- Shadowing of a perfusionist
- Applicants with experience in one of the following allied health care professions is encouraged
    - Perfusion Assistant
    - Respiratory Therapy
    - ECMO Technologist
    - Nurse
    - Emergency Medical Technologist
    - Cardiac Rehabilitation Physiologist
    - Physician Assistant

As a part of the interview process, finalists will be invited to do a mandatory onsite interview with essays to be written. This is in line with industry standards.

Upon acceptance, all students must meet the University's Student Health Requirements which include: Proof of physical examination within one year of application, student liability insurance and health insurance, current immunizations for MMR, Chickenpox, Hepatitis B, Diphtheria, Tetanus, and Pertussis

Curriculum and Degree Map

Use the tables in Appendix A to provide a list of courses and Appendix B to provide a program Degree Map, also referred to as a graduation plan.

Section V: Institution, Faculty, and Staff Support

Institutional Readiness

How do existing administrative structures support the proposed program? Identify new organizational structures that may be needed to deliver the program. Will the proposed program impact the delivery of undergraduate and/or lower-division education? If yes, how?

The MSCP program will be administratively housed in the Division of Cardiothoracic (CT) Surgery within the School of Medicine at the University of Utah. The MSCP program will be taught by members of the CT surgery perfusion staff currently employed within the Division of CT Surgery. Collaboration with the PA program to share three introductory courses has been approved. All classes being taught in the MSCP program will be based on the requirements of the field as set by the external accreditation body and will be developed/taught by the existing licensed perfusionists in the Division of CT Surgery. The MSCP program will have minimal to no negative impact on the existing graduate and certificate programs due to the relatively small number of students admitted at any given time. It will also be the only program of its kind at the University and anticipate that it will not negatively impact other educational programs on campus. Required prerequisite classes are currently being taught at the undergraduate level at all USHE institutions and no additional undergraduate coursework needs to be developed.

The daily operations of the MSCP program will be handled within the Division of CT Surgery and we anticipate eventually hiring a 1.0 FTE academic advisor to support the program. As a graduate program at the University of Utah, we will be utilizing the administrative structures and services currently in place on campus. These include, but are not limited to: Graduate Admissions, the University of Utah Registrar and Scheduling Office, The Graduate School Dean's Office, libraries, School of Medicine classrooms, Financial Aid and Scholarships, Income Accounting, health sciences simulation center, Student Health Centers, recreation facilities, and access to housing & residential services. These existing resources are vital to the success of the MSCP program, yet the overall impact of this program on existing structures will be minimal due to the anticipated class size of 4 students per year. The Eccles Health Sciences Library has committed to supply resources needed for the program as well as support its students.

The State of Utah is uniquely positioned to house a MSCP program. Students at the University of Utah will receive a large benefit from the University's clinical partnerships including the Huntsman Cancer Institute, the Salt Lake City Veteran Affairs (VA) Hospital, Primary Children's, as well as our regional affiliate hospitals. In other perfusion programs, students can be sent across the country to complete their requisite clinical rotations. Having the concentration of high-quality medical centers and affiliates as partners allows our students to be able to remain (largely) in Salt Lake City to complete their assigned hours in the required number of specialties. This reduces the burden on students while also making this program more attractive to the graduates of Utah's undergraduate institutions who are looking to remain in the area.

Faculty

Describe faculty development activities that will support this program. Will existing faculty/instructions, including teaching/ graduate assistants, be sufficient to instruct the program or will additional faculty be recruited? If needed, provide plans and resources to secure qualified faculty. Use Appendix C to provide detail on faculty profiles and new hires.

The MSCP program will be staffed by the existing licensed perfusionists from the Division of CT Surgery. In the field of perfusion, a master's degree and national licensure is considered the terminal degree and training.

The external accrediting body requirement for leadership of the program states that the director must have 2 years of teaching experience and must have at least five years of perfusion practice experience. The Program Director/ Director of Graduate Studies will be Kirk R. Bingham, MS, CCP from the Division of CT Surgery, and his eligibility to take on this role has been verified. The lab coordinator for the proposed program will be Clint Colby, MS CCP. He will be in charge of the rigorous laboratory sections taught throughout the first year of the didactic curriculum. The Chief Medical Advisor for the MSCP program will be Dr. Craig Selzman, MD, Cardiothoracic Division Chief and Professor in the School of Medicine. Dr. Selzman is part of the internal advisory committee and will be helping to plan, organize, conduct, revise, and evaluate the perfusion education program. All classes taught within the program will be covered by the existing perfusion staff within the Division of CT Surgery and the PA program faculty. Perfusionists from outside hospitals may be employed to help if needed as teachers, mentors,

preceptors or to provide external expertise. The outside accrediting body requires that faculty teaching within the school must be individually qualified and must be effective in teaching the subject(s) assigned. All faculty currently assigned have met this requirement and as new perfusionists are brought into the department, they will be subject to the same requirements and verification.

The director will be responsible for initial course development and structure, course scheduling, faculty selection for particular class instruction, placing students with faculty for advisory needs, and structuring/placing students for clinical rotations. The lab coordinator and Division of CT surgery staff will assist the director in these activities. Once the MSCP program is operating at full capacity, the director will be devoting 0.5 FTE to running the program.

Staff

Describe the staff development activities that will support this program. Will existing staff such as administrative, secretarial/ clerical, laboratory aides, advisors, be sufficient to support the program or will additional staff need to be hired? Provide plans and resources to secure qualified staff, as needed.

Heather Clark, RN MBA, Division of Cardiothoracic Surgery Division Director, will be assisting with all planning, organizing, revising, and evaluations of the program. Additional administrative support will be provided by the to-be-hired academic advisor and other administrative positions already existing within the Department of Surgery, Division of CT Surgery's infrastructure.

The Division of CT Surgery, has allocated funds to hire an additional 1.0 FTE academic advisor for the MSCP program. This position will be in charge of overall administration, advising on program requirements and graduation requirements, coordinating faculty meetings, website updates, rotation coordination, and any other needs to support the director, coordinator, and teaching faculty.

Student Advisement

Describe how students in the proposed program will be advised.

Upon admission into the master's program, each student will be assigned a faculty advisor. This faculty advisor will mentor their student(s) throughout their studies, culminating in supervising their final research project. They will serve as resource for the student with curriculum, the masters project, laboratory, career advice, and any questions they have while going through the program. Students will also have access to an academic advisor will work in tandem with faculty and program leadership to ensure students are notified about relevant University policies, are meeting registration requirements, and stay on track to graduation. Academic progress by each student will be tracked by a three person committee lead by the the MSCP Director of Graduate Studies and include the lab coordinator and a third faculty member. They will meet at the conclusion of each semester to review semester grades and to review comments and evaluations provided by clinical preceptors during students shadowing and clinical rotations to determine student advancement through this 6 semester program. Major milestones for this committee to review include: first semester didactic grades, performance in lab, performance in clinical rotations, and a final comprehensive exam to inform students of their level of preparedness to take boards. In this program, failing a clinical rotation (rotations are graded as Credit/No Credit) will lead to dismissal from the program. This committee will also review any notices of inadequate performance as it arises. Finally, this group will also do a comprehensive review of each student file at the end of their program to approve students for graduation. Monthly meetings held by administrative staff and faculty will be held to discuss information on classes, University requirements, and master's project expectations, among other issues, to help support the faculty and advisors with these responsibilities.

Library and Information Resources

Describe library resources required to offer the proposed program if any. List new library resources to be acquired.

The Eccles Health Sciences Library has numerous resources in the areas of anatomy, physiology, pathophysiology, pharmacology, cardiac surgery and other related disciplines. The library also has current subscriptions to a number of noteworthy journals that would support this degree program. Students will have access to a strong collection of supporting databases to help them throughout their didactic coursework and for their master's project development. The Eccles Library offers access to a number of facilities and resources to support the MSCP program, including video and audio production studios and equipment.

Projected Enrollment and Finance

Use Appendix D to provide projected enrollment and information on related operating expenses and funding sources.

Section VI: Program Evaluation

Program Assessment

Identify program goals. Describe the system of assessment to be used to evaluate and develop the program.

The main goal of the MSCP program is threefold. First, it strives to develop highly trained, professional perfusionists to be successful, competent, and compassionate members of the cardiac surgery team. Second, it plans to fulfill a void in the State of Utah to provide a graduate training opportunity to interested students to allow them to continue their studies in the state. Finally, we aim to graduate students who will meet the ongoing shortage of perfusionists in the State of Utah and nationwide. To achieve our vision, the University of Utah MSCP program will:

-Continuously build upon our goals and mission to provide our students the best education as possible and make them the most sought-after candidates in the perfusion profession.
-Prepare students to be life-long learners, educators, researchers, and leaders.
-Become international leaders in perfusion education.

The overall program goals are:

-To prepare competent, entry-level perfusionists in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains.
-To provide a base knowledge of perfusion theory and the skill to implement that knowledge and proficiency in its application in accordance with the needs of healthcare providers and employers.
-To maintain an accredited program with a curriculum designed to ensure the requisite knowledge and skills for entry into perfusion practice.
-To provide fluency of professional communication, behaviors, and attitudes between all medical disciplines.
-To provide the skills and understanding required for life-long learning and professional development.
-*To prepare students to qualify for the American Board of Cardiovascular Perfusion certification examination*

The national accrediting body for perfusion programs (AC-PE) requires that all students taking the national board exams (basic science and clinical exams) in any particular year must pass at an overall rate of 70%. For example, if the first cohort of 4 students in our MSCP program take the exams upon completion of our program, 3 out of the 4 must pass both exams to guarantee that the program graduating those students is able to keep their national accreditation. For our program, we will strive to have a 100% pass rate for these exams due to the small class sizes and intimate nature of the program. However, the program will officially recognize and follow the national accreditation standards of a 70% pass rate to measure program effectiveness and maintain external accreditation.

Student Standards of Performance

List the standards, competencies, and marketable skills students will have achieved at the time of graduation. How and why were these standards and competencies chosen? Include formative and summative assessment measures to be used to determine student learning outcomes.

In order for MSCP students to graduate from this proposed program, all students must complete all required coursework with a 3.0 or higher GPA. No courses within the proposed program will be elective and must all be successfully completed by the end of the two-year program. Students are required to maintain full-time enrollment for all 6 semesters. They must also complete the in-class master's project that will be guided by their assigned faculty advisor. A grade of B- or lower in any course will not be accepted, which is in line with the University Graduate School's graduation requirements. Any lab rotations (graded on a Credit/No Credit basis) where No Credit is received, will not be accepted and will lead to dismissal from the MSCP program.

The MSCP students must meet the performance standards in the following competency areas:

-Perfusion technology science knowledge and technical skills, including heart lung machines, cell savers, balloon pumps, heater coolers, ACTs, ventricular assist devices, extracorporeal membrane oxygenation devices, cerebral oximetry machines, etc.
-Interprofessional healthcare, operating room, and perfusion environments knowledge.

-Monitoring the hemodynamics of the adult and pediatric cardiovascular patient.
-Anatomy, physiology, and pharmacology knowledge, skills, and assessments.
-Research methods and journal review skills and knowledge.
-Analytical and critical thinking.
-Quality, risk, and failure mode analysis processes.
-Effective communication.

Means of Assessment:
-Student grades will be assigned based on didactic and clinical coursework.
-During the didactic phase instructors will instruct and give exams based on the curriculum being taught. Under each faculty's discretion, and under supervision of the director, grades will be based on exams, quizzes, class assignments, and attendance. These grades will then be evaluated to determine if students are making adequate progress and if the courses are at the appropriate level for the students.
-All students that pass their didactic coursework will be allowed to go onto clinical rotations. During clinical rotations, students will be under the supervision of a certified clinical perfusionist. Under the discretion of the certified clinical perfusionist, students will be instructed and graded according to the observation/work they performed on any particular day. Assessments will be completed on a daily basis for each student by each individual clinical instructor. These assessments will be evaluated to determine if students are making adequate progress and are learning the needed skills to become a certified clinical perfusionist. Semester summaries will also be compiled to be forwarded to each student to show their particular assessments from each clinical preceptor. Comments will also be provided to show the students strengths and weaknesses to help them evaluate how they can get better. All evaluations will be compiled and forwarded to each clinical site to show the clinical preceptors the progress the students are making.
-Surveys will be administered throughout the year to determine faculty confidence levels in teaching any particular course, attitudes during the program, and any changes/goals they would like to see made to the growing program.
-Non-graded assessments will be made at the end of each didactic year with comprehensive material from all the curriculum taught. This exam will then be re-administered at the end of the clinical year to evaluate the students' knowledge and help them evaluate what areas they need to improve on before they take their board exams following graduation. These exams will be written under the same context as the board exams administered by the American Board of Cardiovascular Perfusion.
-Quarterly meetings will also be held with internal committee members and all school faculty to discuss program goals, program effectiveness, attitudes of all participating in the program, and any improvements/changes that can be made to the overall program.
-A final report will be made showing graduation rates, board pass rates, and job placement rates and will be updated yearly on the programs website
-End of year surveys will be given to all graduating students to receive feedback on how they feel the program was administered, changes they would make, curriculum modifications, etc.

To maintain the quality of the overall program feedback from current and former students, faculty, and internal/ external advisory boards will be sought to determine how the program can improve. The feedback will provide guidance on program curriculum, laboratory/simulation sessions, student needs, and overall program content.

Appendix A: Program Curriculum

List all courses, including new courses, to be offered in the proposed program by prefix, number, title, and credit hours (or credit equivalences). Indicate new courses with an X in the appropriate columns. The total number of credit hours should reflect the number of credits required to be awarded the degree.

For variable credits, please enter the minimum value in the table for credit hours. To explain variable credit in detail as well as any additional information, use the narrative box at the end of this appendix.

Course Number	NEW Course	Course Title	Credit Hours
General Education Courses (list specific courses if recommended for this program on Degree Map)			
		General Education Credit Hour Sub-Total	
Required Courses			
MSCP 6001	X	Perfusion Science 1	3
MSCP 6002	X	Perfusion Science 2	3
MSCP 6003	X	Perfusion Science 3	3
MSCP 6501	X	Interdisciplinary Healthcare 1	1
MSCP 6502	X	Interdisciplinary Healthcare 2	1
MSCP 6010	X	Perfusion Lab 1	2
MSCP 6020	X	Perfusion Lab 2	3
MSCP 6030	X	Perfusion Lab 3	3
MSCP 6100	X	Intro to Hospital Environments	1
MSCP 6200	X	Research Methodologies	1
MSCP 6201	X	Masters Project 1	1
MSCP 6202	X	Masters Project 2	1
MSCP 6301	X	Procedure Observations & Lectureships 1	2
MSCP 6302	X	Procedure Observations & Lectureships 2	2
MSCP 6600	X	Mechanical Circulatory Support	2
MSCP 6401	X	Perfusion Anatomy, Physiology, and Surgical Repair	3
MSCP 6402	X	Pediatric Perfusion	3
MSCP 6403	X	Hemodynamic Monitoring	3
MSCP 6203	X	Perfusion Standards and Liability Managment	2
MSCP 6801	X	Advanced Topics in Perfusion	1
MSCP 6802	X	Board Certification Prep	1
MSCP 6901	X	Clinical Rotation 1	4
MSCP 6902	X	Clinical Rotation 2	4
MSCP 6903	X	Clinical Rotation 3	4
MSCP 6904	X	Clinical Rotation 4	4
MSCP 6905	X	Clinical Rotation 5	4
MSCP 6906	X	Clinical Rotation 6	4
MSCP 6907	X	Clinical Rotation 7	4
MSCP 6908	X	Clinical Rotation 8	4
PAS 6002		Applied Anatomy	3
PAS 6003		Medical Physiology	3
PAS 6007		Clinical Pharmacology	2

Course Number	NEW Course	Course Title	Credit Hours
		Required Course Credit Hour Sub-Total	82
Elective Courses			
		Elective Credit Hour Sub-Total	
		Core Curriculum Credit Hour Sub-Total	82

Are students required to choose an emphasis? *Yes or* *No*

Course Number	NEW Course	Course Title	Credit Hours
Name of Emphasis:			

Emphasis Credit Hour Sub-Total	
Total Number of Credits to Complete Program	82

Program Curriculum Narrative

Describe any variable credits. You may also include additional curriculum information.

There are no planned variable credits for this proposed program.

Degree Map

Degree maps pertain to undergraduate programs ONLY. Provide a degree map for proposed program. Degree Maps were approved by the State Board of Regents on July 17, 2014 as a degree completion measure. Degree maps or graduation plans are a suggested semester-by-semester class schedule that includes prefix, number, title, and semester hours. For more details see http://higheredutah.org/pdf/agendas/201407/TAB%20A%202014-7-18.pdf (Item #3).

Please cut-and-paste the degree map or manually enter the degree map in the table below.

FIRST YEAR

Summer Semester (18 credits)

-(MSCP 6501) Interdisciplinary Healthcare 1 (1 credit)
-(MSCP 6100) Intro to Hospital Environments (1 credit)
-(PAS 6002) Applied Anatomy (3 credits)
-(MSCP 6403) Hemodynamic Monitoring (3 credits)
-(PAS 6003) Medical Physiology (3 credits)
-(MSCP 6001) Perfusion Science 1 (3 credits)
-(MSCP 6010) Perfusion Lab 1 (2 credits)
-(PAS 6007) Principles of Pharmacology (2 credits)

Fall Semester (16 credits)

-(MSCP 6502) Interdisciplinary Healthcare 2 (1 credit)
-(MSCP 6200) Research Methodologies (1 credits)
-(MSCP 6201) Masters Project 1 (1 credit)
-(MSCP 6401) Perfusion Anatomy, Physiology, and Surgical repair (3 credits)
-(MSCP 6002) Perfusion Science 2 (3 credits)
-(MSCP 6301) Procedure Observations & Lectureships 1 (2 credits)
-(MSCP 6020) Perfusion Lab 2 (3 credits)
-(MSCP 6600) Mechanical Circulatory Support (2 credits)

Spring Semester (14 credits)

-(MSCP 6202) Masters Project II (1 credit)
-(MSCP 6203) Perfusion Standards and Liability Management (2 credits)
-(MSCP 6402) Pediatric Perfusion (3 credits)
-(MSCP 6003) Perfusion Science 3 (3 credits)
-(MSCP 6302) Procedure Observations & Lectureships 2 (2 credits)
-(MSCP 6030) Perfusion Lab 3 (3 credits)

SECOND YEAR

Summer Semester (8 credits)

-(MSCP 6901) Clinical Rotation 1 (6 weeks)(4 credits)
-(MSCP 6902) Clinical Rotation 2 (6 weeks)(4 credits)

Fall Semester (13 credits)

-(MSCP 6903) Clinical Rotation 3 (6 weeks)(4 credits)

-(MSCP 6904) Clinical Rotation 4 (6 weeks)(4 credits)
-(MSCP 6905) Clinical Rotation 5 (6 weeks)(4 credits)
-(MSCP 6801) Advanced Topics in Perfusion (1 credit)

Spring Semester (13 credits)

-(MSCP 6906) Clinical Rotation 6 (6 weeks)(4 credits)
-(MSCP 6907) Clinical Rotation 7 (6 weeks)(4 credits)
-(MSCP 6908) Clinical Rotation 8 (6 weeks)(4 credits)
-(MSCP 6802) Board Certification Prep (1 credit)

Appendix C: Current and New Faculty / Staff Information

Part I. Department Faculty / Staff

Identify # of department faculty / staff (headcount) for the year preceding implementation of proposed program.

	# Tenured	# Tenure -Track	# Non -Tenure Track
Faculty: Full Time with Doctorate	0	0	0
Faculty: Part Time with Doctorate	0	0	0
Faculty: Full Time with Masters	0	0	8
Faculty: Part Time with Masters	0	0	0
Faculty: Full Time with Baccalaureate	0	0	1
Faculty: Part Time with Baccalaureate	0	0	0
Teaching / Graduate Assistants			0
Staff: Full Time	0	0	0
Staff: Part Time	0	0	0

Part II. Proposed Program Faculty Profiles

List current faculty within the institution -- with academic qualifications -- to be used in support of the proposed program(s).

	First Name	Last Name	Tenure (T) / Tenure Track (TT) / Other	Degree	Institution where Credential was Earned	Est. % of time faculty member will dedicate to proposed program.	If "Other," describe
Full Time Faculty							
	Kirk	Bingham	non-tenure	CCP, MS	Midwestern University	50%	
	Sam	Harmon	non-tenure	CCP, MS	Midwestern University	50%	
	Chris	Blaylock	non-tenure	CCP, MS	Midwestern University	20%	
	Brandon	Tomacek	non-tenure	CCP, MS	Midwestern University	20%	
	Paul	Matlin	non-tenure	CCP, MS	Midwestern University	20%	
	Jake	Wimmer	non-tenure	CCP, MS	Midwestern University	20%	
	Robert	Bowers	non-tenure	CCP		20%	
	Heather	Clark	non-tenure	RN, MBA	University of Utah	20%	
Part Time Faculty							

	First Name	Last Name	Tenure (T) / Tenure Track (TT) / Other	Degree	Institution where Credential was Earned	Est. % of time faculty member will dedicate to proposed program.	If "Other," describe

Part III: New Faculty / Staff Projections for Proposed Program

Indicate the number of faculty / staff to be hired in the first three years of the program, if applicable. Include additional cost for these faculty / staff members in Appendix D.

	# Tenured	# Tenure -Track	# Non -Tenure Track	Academic or Industry Credentials Needed	Est. % of time to be dedicated to proposed program.
Faculty: Full Time with Doctorate	0	0	0	NA	NA
Faculty: Part Time with Doctorate	0	0	0	NA	NA
Faculty: Full Time with Masters	0	0	0	NA	NA
Faculty: Part Time with Masters	0	0	0	NA	NA
Faculty: Full Time with Baccalaureate	0	0	0	NA	NA
Faculty: Part Time with Baccalaureate	0	0	0	NA	NA
Teaching / Graduate Assistants			0	NA	NA
Staff: Full Time	0	0	1	Bachelors degree or higher	100%
Staff: Part Time	0	0	0	NA	NA

Appendix D: Projected Program Participation and Finance

Part I.

Project the number of students who will be attracted to the proposed program as well as increased expenses, if any. Include new faculty & staff as described in Appendix C.

Three Year Projection: Program Participation and Department Budget						
	Year Preceding Implementation	New Program				
		Year 1	Year 2	Year 3	Year 4	Year 5
Student Data						
# of Majors in Department	0	0	0	0	0	0
# of Majors in Proposed Program(s)		4	9	10	10	10
# of Graduates from Department	0	0	0	0	0	0
# Graduates in New Program(s)		0	4	5	5	5

Department Financial Data				
	Department Budget			
		Year 1	Year 2	Year 3
Project additional expenses associated with offering new program(s). Account for New Faculty as stated in Appendix C, "Faculty Projections."	Year Preceding Implementation (Base Budget)	Addition to Base Budget for New Program(s)	Addition to Base Budget for New Program(s)	Addition to Base Budget for New Program(s)
EXPENSES – nature of additional costs required for proposed program(s)				
List salary benefits for additional faculty/staff each year the positions will be filled. For example, if hiring faculty in year 2, include expense in years 2 and 3. List one-time operating expenses only in the year expended.				
Personnel (Faculty & Staff Salary & Benefits)		$67,500	$67,500	$67,500
Operating Expenses (equipment, travel, resources)		$45,220	$45,220	$45,220
Other:	$0	$0	$0	$0
TOTAL PROGRAM EXPENSES		$112,720	$112,720	$112,720
TOTAL EXPENSES	$0	$112,720	$112,720	$112,720
FUNDING – source of funding to cover additional costs generated by proposed program(s)				
Describe internal reallocation using Narrative 1 on the following page. Describe new sources of funding using Narrative 2.				
Internal Reallocation				
Appropriation				
Special Legislative Appropriation				
Grants and Contracts				
Special Fees				
Tuition		$91,124	$182,248	$182,248
Differential Tuition (requires Regents approval)				
PROPOSED PROGRAM FUNDING		$91,124	$182,248	$182,248
TOTAL DEPARTMENT FUNDING	$0	$91,124	$182,248	$182,248
Difference				
Funding - Expense	$0	($21,596)	$69,528	$69,528

Part II: Expense explanation

Expense Narrative

Describe expenses associated with the proposed program.

The majority of overall programmatic expenses will be an administrative support person (budgeted at 1.0 FTE) and the cost of equipment, lab rental fees, and associate supplies. It is likely that the MSCP will pay a partial FTE of an existing administrative professional in the Department of Surgery, which would further reduce the new costs of the program. The director position, lab coordinator, and licensed cardiovascular perfusionists are already in place at the School of Medicine within the Division of CT Surgery.

In anticipation of creating this program, the Division of Cardiothoracic Surgery hired 6 perfusionists to have both teaching and clinical responsibilities. Each of them is a 1.0 FTE staff member in the School of Medicine and their salaries are being paid out of divisional funding derived from clinical revenue. While there will be a change in each individual perfusionist's clinical effort to make time for educational responsibilities, they will continue to be paid out of the same divisional resources regardless of how their FTE is split. Since they were hired to participate in the education program along with their clinical responsibilities, their salaries (or partial FTE) are not new expenses incurred to start this program and will continue to be funded by the same source. Unlike some other allied health professions, perfusionists do not bill for their time, instead they are contracted out to hospitals by the the Division of CT Surgery as a group. Any reduction in an individual's clinical time will not impact salary support or clinical revenue brought back to the division.

The time and effort needed to create and implement an 82 credit graduate program is substantial. The reasoning behind the current staffing levels (six perfusionists) is so that all personnel would be hired and onboarded prior to implementation without impacting the clinical needs of the U of U Hospital, the VA, and Primary Children's Hospital. The Division of CT Surgery and Department of Surgery leadership are committed to continuing to support the perfusion group and this program for several reasons. First and foremost, it meets the educational mission of the department and School of Medicine. Second, because these trainees are essential to meeting the ongoing clinical needs of the region including our flagship hospital.

The other expenses associated with the proposed program are: recruitment and marketing funds, professional travel, supplies, IT, and other (Self-study, etc.) which will be minimal. These expenses will be covered by the Division of CT Surgery initially and then will be covered by tuition when the program is at steady state.

The equipment needed to start the MSCP includes: two heart lung machines, two cell savers, balloon pump, six heart lung packs (disposables), six myotherm disposables, two cases of normosol, four lab stools, two heater coolers, tool box/tools, one ECMO machine (cardiohelp, centrimag, etc.), two sechrist gas mixers, medical PPE, 15 tubing clamps, and pall filters. The items on this list will be increased over the years of the program to replace broken equipment, provide extra equipment for increased students in program, and to update equipment to train students with the most recent technology available in the field.

While there are physical space renovation needs to help improve the existing perfusion space to be acceptable for teaching and learning, we will have 3-4 years to acquire the funding needed to remodel before the new students will outgrow the existing space. It is anticipated that new funds received from donors will help to determine timeline of any space renovation and needed costs.

Part III: Describe funding sources

Revenue Narrative 1

Describe what internal reallocations, if applicable, are available and any impact to existing programs or services.

The Division of CT Surgery is prepared to use existing funds, and to make reallocations to help provide all startup costs related to this program, including equipment and personnel costs. Once the program is at steady state, it is anticipated that tuition dollars will cover administrative overhead, equipment, supplies and lab fees. The Division of CT Surgery and the Department of Surgery have committed to protected time to dedicate towards teaching and educational efforts for the director and lab coordinator position. Additionally, initial funding has been committed for an (up to) 1.0 FTE administrative employee to assist the

faculty in the day-to-day operations and coordination of the program.

The internal reallocation of funding might impact some non-critical initiatives within the Division of CT Surgery. However, this will not mean that critical initiatives within the Division of CT Surgery will not receive support, rather that the timing will be adjusted to ensure this new program has the financial support and stability it needs in the critical first 2-3 years.

If we continue to be successful in seeking donations of equipment and for programmatic support, the financial impact on the Division of CT Surgery will lessen and the Division of CT Surgery will not need to rely on reallocations.

Revenue Narrative 2

Describe new funding sources and plans to acquire the funds.

The Master of Science in Cardiovascular Perfusion has the full support of the Department of Surgery and financial support from the Division of CT Surgery. We also have partnered with our Senior Director of Advancement to help secure gift-in-kind donations and additional programmatic funding from individual donors, family foundations, and industry partners.

In the short-term, the initial costs will be covered by the Department of Surgery and Division of CT Surgery. The two major initial costs to help begin the program will be the renovation of the student lab and the equipment costs noted above.

The MSCP program has developed a tuition model and is seeking separate approval on that proposal through the appropriate and required channels. It is anticipated that after a 2 year start up period, the proposed tuition model will adequately cover all new costs to the division derived from this educational program. All revenue generated will be utilized for new equipment, lab renovations, and salary support for didactic teaching responsibilities.

Of the equipment noted above in the expense narrative, we have already received donations of:

- Two heart-lung machines (donated by Tacoma General Hospital)
- Two cell saver machines (donated by the University of Utah Hospital)
- Myocardial protection systems, ecmo equipment, and pumps (donated by the University of Utah Hospital).

The MSCP program will be at the receiving end of authorized redistribution of clinical assets from the University of Utah Hospital. Our hospital regularly purchases and retires equipment through surplus. This program will benefit from having access to the necessary expensive equipment at little to no cost to the program.

It is preferred that the student lab space for the MSCP program at the University of Utah be renovated prior to the first student being enrolled, however there is time to complete this renovation over a period of 1-3 years.

Three potential donors have been identified to help fund programmatic costs, equipment needs, and lab renovation. One individual donor will be solicited for $300,000 prior to June 30, 2019 to help fund programmatic start-up costs. Several companies will be approached to donate equipment and programmatic or scholarship dollars for the MSCP program. We will be seeking protective equipment (PPE) donations from Medtronic, equipment donation from Biomed and Spectrum Medical, and programmatic support from Axlotal Biologics.

Within the University of Utah, we have a group of internal stakeholders that are very invested in the success of the proposed MSCP program. Currently, these stakeholders rely on the University for contracted perfusion assistance (provided by perfusionists within the Division of CT Surgery) in their facilities, and both entities would benefit greatly from a pipeline of students to hire for their own perfusion programs. We are exploring different opportunities to have these stakeholders support the MSCP program with upfront support to help defray the start-up costs associated with equipment and renovation of student lab space.