University of Minnesota Rochester

2013-15 UNDERGRADUATE CATALOG

This file serves as an official record of University, college, and program requirements and policies during a specific time period. It includes a directory of undergraduate programs, majors, and course descriptions. It also includes a list of University policies.

NOTE: The information in this catalog is subject to change without notice. Colleges and departments make changes in their degree requirements and course descriptions frequently. For the most current information, check with department offices, advisers, and visit the Online Catalog at www.catalogs.umn.edu.

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Rochester Campus

Health Professions B.S.

UM Rochester

UMR Chancellor's Office

• Program Type: Baccalaureate
• Requirements for this program are current for Fall 2013
• Required credits to graduate with this degree: 121 to 126
• Required credits within the major: 60 to 66
• This program requires summer terms.
• None
• Degree: Bachelor of Science

The Bachelor of Science in Health Professions (BSHP) is an educational collaboration between the University of Minnesota Rochester and Mayo School of Health Sciences. The curriculum has a broad focus and includes rigorous science foundations, liberal education, and prerequisite courses selected to meet the need for deeper academic preparation in health professions. Students majoring in the health professions are admitted into one of four tracks: Echocardiography, Radiography, Respiratory Care or Sonography. Academic coursework is coordinated with clinical rotations at Mayo Clinic to optimize the learning experience. The BSHP program prepares students to become certified health professionals in select allied health fields where increased technical complexity and strong cognitive abilities are needed due to specialization and new technologies in health care.

Program Delivery

This program is available:
• via classroom (the majority of instruction is face-to-face)

Admission Requirements

A GPA above 2.0 is preferred for the following:
• 2.50 already admitted to the degree-granting college
• 2.50 transferring from another University of Minnesota college
• 2.50 transferring from outside the University

For information about University of Minnesota admission requirements, visit the Office of Admissions website.

Required prerequisites

Statistics
MATH 1161 - Statistics and Discrete Mathematics [MATH] (3.0 cr)
or STAT 3011 - UMTC Course - Introduction to Statistical Analysis

College Algebra
MATH 1111 - College Algebra, Trigonometry, and Precalculus [MATH] (3.0 cr)
or MATH 1031 - UMTC Course - College Algebra and Probability
or MATH 1051 - UMTC Course - PreCalculus

Chemistry with Laboratory
CHEM 1231 - Organic Chemistry I [PHYS] (4.0 cr)
or CHEM 2331 - General Chemistry I (4.0 cr)
or CHEM 1015 - UMTC Course - Introductory Chemistry I AND CHEM 1017 Introductory Chemistry I Lab
or CHEM 1061 - UMTC Course - Chemical Principles I AND CHEM 1065 Chemical Principles I Lab

Physics with Laboratory
PHYS 1251 - Physics I [PHYS, TS] (4.0 cr)
or PHYS 1101W - UMTC Course - Introductory College Physics I
or PHYS 1201W - UMTC Course Introductory Physics for Biology & PreMed I

Microbiology with Laboratory
Take exactly 3 course(s) from the following:
• BIOL 3341 - Microbiology (2.0 cr)
• BIOL 3342 - Microbiology and Environmental Issues (1.0 cr)
• BIOL 3345 - Microbiology Lab (1.0 cr)
or VBS 2032 - UMTC Course - General Microbiology with Lab
or MICB 3301 - UMTC Course - Biology of Microorganisms
Anatomy and Physiology
Take exactly 2 course(s) from the following:
• BIOL 2331 - Anatomy and Physiology I [BIOL] (4.0 cr)
• BIOL 2332 - Anatomy and Physiology II (4.0 cr)
or PHSL 3051 - UMTC Course - Human Physiology
or ANAT 3601 - UMTC Course - Principles of Human Anatomy
ANAT 3602 - UMTC Course - Principles of Human Anatomy Lab

Psychology
PSY 1511 - Psychology [SOCS] (3.0 cr)
or PSY 1001 - UMTC Course - Introduction to Psychology

Writing
WRIT 1301 - UMTC Course - University Writing
or Writing Enriched Curriculum
WRIT 1511 - Writing Studio I (1.0 cr)
WRIT 1512 - Writing Studio II (1.0 cr)
or English (two semesters, without a writing intensive or writing enriched curriculum)
or English (one semester, writing intensive curriculum with lower division writing intensive courses)

Speech or Communication
WRIT 3511 - Communication Methods (3.0 cr)
or COMM 1101 - UMTC Course - Introduction to Public Speaking

Ethics
HUM 1441 - Introduction to Ethics [CIV] (3.0 cr)
or SOC 1641 - Social Justice and Ethical Decision Making [CIV] (3.0 cr)
or PHIL 1003W - UMTC Course - Introduction to Ethics

Medical Terminology
PHAR 1002 - UMTC Course - Health Sciences Terminology
or a course of two or more credits in medical terminology

General Requirements
All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the liberal education requirements.

Program Requirements
Admission to Mayo School of Health Sciences in one of four programs: echocardiography, radiography, respiratory care, or sonography.

Program Sub-plans
Students are required to complete one of the following sub-plans. (Note for the Twin Cities and Morris campuses: The honors sub-plan does not meet this requirement. Honors students are required to complete one sub-plan plus the honors sub-plan. Please see an adviser if no honors sub-plan is listed for the program.)

Echocardiography-Mayo School of Health Sciences
The BSHP Echocardiography Track delivers upper-division curriculum designed to prepare students to become well-rounded, fully competent cardiac sonographers in an environment based on teamwork and mutual respect. The program offers an exceptional educational experience by providing high-quality didactic and clinical experiences that prepare students to:
Perform patient assessments, acquire and analyze data obtained using ultrasound and related diagnostic technologies, provide a summary of findings to the physician to aid in patient diagnosis and management; and use independent judgment and systematic problem solving methods to produce high quality diagnostic information and optimize patient care.

Echocardiography
The echocardiography curriculum currently consists of 66 credits.
ECHO 3011 - Foundations of Echocardiography [TS] (8.0 cr)
ECHO 3101 - Cardiovascular Anatomy & Physiology (2.0 cr)
ECHO 3202 - Adult Echocardiography I (2.0 cr)
ECHO 3212 - Adult Echocardiography II (2.0 cr)
ECHO 3222 - Adult Echocardiography III (2.0 cr)
ECHO 3301 - Clinical Practicum I (3.0 cr)
ECHO 3302 - Clinical Practicum II (7.0 cr)
ECHO 3403 - Echocardiographic Application (3.0 cr)
ECHO 3503 - Stress Echocardiography (2.0 cr)
ECHO 4111 - Ultrasound Physics I (2.0 cr)
ECHO 4112 - Ultrasound Physics II (2.0 cr)
ECHO 4211 - Congenital Heart Disease (3.0 cr)
ECHO 4303 - Clinical Practicum III (8.0 cr)
ECHO 4401 - Clinical Practicum IV (8.0 cr)
ECHO 4402 - Clinical Practicum V (10.0 cr)
ECHO 4501 - Research Project and Publication I (1.0 cr)

Radiography-Mayo School of Health Sciences
The BSHP Radiography Track delivers upper-division curriculum designed to prepare students to become well-rounded, fully competent radiographers in an environment based on teamwork and mutual respect. Radiography is a challenging career involving the use of highly sophisticated equipment to create x-rays anatomical images that are used by physicians to diagnose disease, injury, or disability. Radiographers have direct patient contact in clinic and hospital settings and are valuable members of the primary health care team. Our high-quality professional curriculum presents a broad didactic component, comprehensive clinical rotations, and an environment that instills professional skills in our students.

Radiography
The radiography curriculum currently consists of a total of 62 credits.
HP 3021 - Patient Care Techniques (1.0 cr)
HP 4802 - Health Economics and Finance [DSJ] (3.0 cr)
HP 4902 - Management and Leadership in Healthcare [GP] (2.0 cr)
RADI 3011 - Foundations of Radiography [TS] (3.0 cr)
RADI 3101 - Radiographic Procedures I (3.0 cr)
RADI 3102 - Radiographic Procedures II (7.0 cr)
RADI 3111 - Radiation Physics (2.0 cr)
RADI 3202 - Principles of Radiographic Exposure (2.0 cr)
RADI 3301 - Clinical Practicum I (5.0 cr)
RADI 3302 - Clinical Practicum II (5.0 cr)
RADI 3503 - Radiographic Factor Analysis (1.0 cr)
RADI 3603 - Applied Radiography Topics (1.0 cr)
RADI 4101 - Radiographic Procedures III (3.0 cr)
RADI 4241 - Radiation Protection Advanced Imaging (3.0 cr)
RADI 4303 - Clinical Practicum III (6.0 cr)
RADI 4401 - Clinical Practicum IV (7.0 cr)
RADI 4402 - Clinical Practicum V (8.0 cr)

Respiratory Care-Mayo School of Health Sciences
The BSHP Respiratory Care Track delivers upper-division curriculum designed to prepare students to become respiratory care practitioners with advanced-level clinical skills. The curriculum includes professional courses and clinical experiences to support professional development and prepares students to serve as consultants to physicians and other medical staff. Students are offered the options to engage in specialized clinical study in areas of adult critical care and patient transport, newborn and pediatric critical care, cardiopulmonary diagnostics-pulmonary function testing, cardiopulmonary rehabilitation, disease prevention, case management in asthma and Chronic Obstructive Pulmonary Disease (COPD), as well as smoking cessation and lung health counseling.

Respiratory Care
The respiratory care curriculum currently consists of a total of 60 credits.
HP 3021 - Patient Care Techniques (1.0 cr)
HP 4802 - Health Economics and Finance [DSJ] (3.0 cr)
HP 4902 - Management and Leadership in Healthcare [GP] (2.0 cr)
RESP 3011 - Foundations of Respiratory Care [TS] (2.0 cr)
RESP 3101 - Respiratory Care Modalities and Equipment I (4.0 cr)
RESP 3102 - Respiratory Care Modalities and Equipment II (4.0 cr)
RESP 3201 - Cardiopulmonary Patient Assessment (4.0 cr)
RESP 3202 - Advanced Cardiopulmonary Physiology and Pathophysiology (3.0 cr)
RESP 3301 - Clinical Practicum I (4.0 cr)
RESP 3302 - Clinical Practicum II (4.0 cr)
RESP 3401 - Seminar in Respiratory Care I (1.0 cr)
RESP 3402 - Seminar in Respiratory Care II (1.0 cr)
RESP 3502 - Clinical Research: Literature, Methodology, and Application (3.0 cr)
RESP 4311 - Advanced Perinatal and Pediatric Respiratory Care (3.0 cr)
RESP 4321 - Advanced Cardiopulmonary Diagnostics (2.0 cr)
RESP 4331 - Cardiopulmonary Rehabilitation, Disease Prevention and Case Management (1.0 cr)
RESP 4341 - Clinical Practicum III: Advanced Respiratory Care (3.0 cr)
RESP 4342 - Clinical Practicum V: Advanced Respiratory Care (3.0 cr)
RESP 4400 - Advanced Adult Respiratory Critical Care Techniques (3.0 cr)
RESP 4401 - Clinical Practicum IV: Advanced Adult Respiratory Critical Care (1.0 cr)
RESP 4402 - Clinical Practicum VI: Advanced Respiratory Critical Care (1.0 cr)
RESP 4501 - Research Project I (1.0 cr)
RESP 4502 - Research Project II (1.0 cr)
RESP 4602 - Grand Rounds (2.0 cr)
Complete Pharmacotherapy for Health Professions (online) UMTC PHAR 3800 is a 3 credit course.

Sonography-Mayo School of Health Sciences
The BSHP Sonography track delivers upper-division curriculum designed to prepare students to become competent, entry-level sonographers in an environment based on teamwork and mutual respect. Students will have the opportunity to train in specialties that include abdomen, obstetrics, gynecology, and peripheral vascular. The program offers an exceptional educational experience by providing high-quality didactic and clinical experiences that prepare students to perform patient assessments, acquire and analyze data obtained using ultrasound and related diagnostic technologies, provide a summary of findings to the physician to aid in patient diagnosis and management, as well as to use independent judgment and systematic problem solving methods to produce high quality diagnostic information and optimize patient care.

Sonography
The sonography curriculum currently consists of a total of 65 credits.
SONO 3011 - Foundations of Sonography [TS] (3.0 cr)
SONO 3111 - Abdomen I Sonography (2.0 cr)
SONO 3201 - Gynecologic Sonography (2.0 cr)
SONO 3121 - Cross-Sectional Abdominal Anatomy (1.0 cr)
SONO 3311 - Vascular Technology (2.0 cr)
SONO 3301 - Clinical Practicum I (3.0 cr)
SONO 3112 - Abdomen II Sonography (3.0 cr)
SONO 3401 - OB Sonography (2.0 cr)
SONO 3312 - Vascular Technology II (3.0 cr)
SONO 3302 - Clinical Practicum II (5.0 cr)
SONO 3503 - Superficial Sonography (2.0 cr)
SONO 3113 - Abdomen III Sonography (2.0 cr)
SONO 3313 - Vascular Technology III (1.0 cr)
SONO 3403 - Concepts Review and Case Studies (2.0 cr)
SONO 4303 - Clinical Practicum III (6.0 cr)
SONO 4111 - Ultrasound Physics I (2.0 cr)
SONO 4201 - Pediatric Sonography (1.0 cr)
SONO 4301 - Fetal Anomalies (2.0 cr)
SONO 4401 - Clinical Practicum IV (7.0 cr)
SONO 4501 - Research Project & Publication (1.0 cr)
SONO 4112 - Ultrasound Physics II (2.0 cr)
SONO 4802 - Mock Exams (1.0 cr)
SONO 4602 - Professional Growth and Development (1.0 cr)
SONO 4402 - Clinical Practicum V (8.0 cr)
SONO 4502 - Research Project and Publication II (1.0 cr)
Rochester Campus

Health Sciences B.S.

UM Rochester
UMR Chancellor’s Office

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2013
- Required credits to graduate with this degree: 120
- Required credits within the major: 78 to 108
- Degree: Bachelor of Science

Rochester students majoring in the health sciences will receive an integrated education across the life/health sciences, the physical sciences, the quantitative sciences, the social sciences, and the arts and humanities. Students must complete at least 120 credits, including at least 79-106 credits in the major. Requirements in the major include coursework in the physical sciences, quantitative sciences, life/health sciences, and social sciences and humanities, in addition to a personalized capstone experience. All courses in the major must be taken A-F, unless the course is only offered S-N.

The Health Sciences B.S. program prepares students for postbaccalaureate education in a broad spectrum of health science related fields and for graduate programs in the sciences, social sciences, and humanities; health profession careers, including certificate programs in the health sciences; professional schools in the health sciences; and entry-level science and laboratory positions in industry, government agencies, and universities.

Program Delivery
This program is available:
- via classroom (the majority of instruction is face-to-face)

Admission Requirements
A GPA above 2.0 is preferred for the following:
- 2.50 transferring from outside the University

For information about University of Minnesota admission requirements, visit the Office of Admissions website.

General Requirements
All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the liberal education requirements.

Program Requirements
Students are required to take 3 semester(s) of Spanish or approved alternate language.

All students are required to complete campus-wide requirements for liberal education and writing. UMR liberal education is integrated into the curriculum throughout the four years and follows the liberal education requirements on the UMTC campus, except that UMR requires all five themes. Writing and communication follows a writing-integrated curriculum and is incorporated throughout the curriculum across all courses.

Life/Health Sciences
BIOL 2311 - Integrative Biology [BIOL] (5.0 cr)
BIOL 2331 - Anatomy and Physiology I [BIOL] (4.0 cr)
PUBH 2561 - Public Health: A Global Perspective [GP] (3.0 cr)
BIOC 3321 - Biochemistry (3.0 cr)
or BIOL 2332 - Anatomy and Physiology II (4.0 cr)
or BIOL 3311 - Molecular Genetics [BIOL, TS] (3.0 cr)
or PUBH 3561 - Environmental Health and Environmental Justice [ENV, SOCS] (3.0 cr)
or Subgroup 2 - Microbiology Option 1
BIOL 3341 - Microbiology (2.0 cr)
BIOL 3342 - Microbiology and Environmental Issues (1.0 cr)
or Subgroup 3 - Microbiology Option 2
BIOL 3341 - Microbiology (2.0 cr)
BIOL 3345 - Microbiology Lab (1.0 cr)
Sublist 4 - Biology options
Take 1 or more course(s) from the following:
- BIOL 4312 - Advanced Topics in Molecular and Cellular Biology and Genetics (4.0 cr)
- BIOL 4364 - Immunology (3.0 cr)
- PUBH 4561 - Introduction to Epidemiology: Research and Data Exploration (3.0 cr)
- BIOL 4342 - Neuroscience (3.0 cr)

Physical Sciences
CHEM 1231 - Organic Chemistry I [PHYS] (4.0 cr)
CHEM 2331 - General Chemistry I (4.0 cr)
PHYS 1251 - Physics I [PHYS, TS] (4.0 cr)

Quantitative
MATH 1161 - Statistics and Discrete Mathematics [MATH] (3.0 cr)
Take 2 or more course(s) from the following:
- MATH 1111 - College Algebra, Trigonometry, and Precalculus [MATH] (3.0 cr)
- MATH 1171 - Calculus, Modeling, and Data I [MATH] (3.0 cr)
- MATH 2161 - Bioinformatics and Biostatistics (3.0 cr)
- MATH 2171 - Calculus, Modeling, and Data II [MATH] (3.0 cr)

Humanities and Social Sciences
HUM 1433 - Introduction to Literature [LITR] (3.0 cr)
HUM 1435 - Introduction to History [HIS, GP] (3.0 cr)
HUM 1441 - Introduction to Ethics [CIV] (3.0 cr)
HUM 1431 - Introduction to Philosophy [AH] (3.0 cr)
PSY 1511 - Psychology [SOCS] (3.0 cr)
SOC 1571 - Introduction to Sociology [SOCS, DSJ] (3.0 cr)
Take 1 or more course(s) from the following:
- HUM 3437 - History and Philosophy of Science [HIS, TS] (3.0 cr)
- HUM 3441 - Ethics of Medicine and the Sciences [AH, CIV] (3.0 cr)
- SOC 3531 - Health Policy in a Global Context [GP, SOCS] (3.0 cr)
- SOC 3571 - Drugs and Society [DSJ, SOCS] (3.0 cr)
- SOC 3581 - Medical Sociology and Technology [SOCS, TS] (3.0 cr)
- HUM 3471 - Literatures of Diversity [DSJ] (3.0 cr)
- HUM 3481 - Technology and Society [TS] (3.0 cr)

Second Language
SPAN 1521, SPAN 1522, SPAN 2521 can be replaced by proficiency exam or an approved alternative language. SPAN 2521 can be replaced by study abroad in a Spanish speaking environment.
SPAN 1520 - Review of Foundations in Spanish (1.0 cr)
SPAN 1521 - Spanish I (3.0 cr)
SPAN 1522 - Spanish II (3.0 cr)
SPAN 2521 - Spanish III (3.0 cr)
or an approved alternative language

Community Engagement
CLI 2522 - Community Collaboratory (3.0 cr)

Writing
WRIT 1511 - Writing Studio I (1.0 cr)
WRIT 1512 - Writing Studio II (1.0 cr)
WRIT 3511 - Communication Methods (3.0 cr)
or advanced technical writing and communications course

Career Development
CLI 1711 - University Experience I (1.0 cr)
CLI 1712 - University Experience II (1.0 cr)
CLI 2711 - Career Exploration I (1.0 cr)
CLI 2712 - Career Exploration II (1.0 cr)
CLI 3711 - Career Preparation (1.0 cr)
CLI 3712 - Capstone Proposal Writing (1.0 cr)

Capstone
CLI 4711 - Capstone Reflections I (1.0 cr)
CLI 4712 - Capstone Reflections II (1.0 cr)  
or CLI 4713 - Capstone Reflections I and II (2.0 cr)  
Take 2 semesters of any capstone opportunity listed below.  
CLI 4696 - Capstone Research Experience (1.0 - 12.0 cr)  
or CLI 4896 - Capstone Certificate in Health Professions (6.0 - 15.0 cr)  
or Equivalent and approved set of courses in a health certificate program or graduate program or other approved capstone experiences (up to 30 credits over 2 semesters)  
or CLI 4496 - Capstone Internship (1.0 - 12.0 cr)  
or CLI 4393 - Capstone Directed Study (1.0 - 3.0 cr)

Electives  
Electives may not be used to satisfy other requirements but may be replaced by courses that count towards the capstone experience, including courses in approved health certificate programs or graduate programs.  
Take 11 or more credit(s) from the following:

- BIOC 3321 - Biochemistry (3.0 cr)  
- BIOL 2332 - Anatomy and Physiology II (4.0 cr)  
- BIOL 3311 - Molecular Genetics [BIOL, TS] (3.0 cr)  
- BIOL 3341 - Microbiology (2.0 cr)  
- BIOL 3342 - Microbiology and Environmental Issues (1.0 cr)  
- BIOL 3345 - Microbiology Lab (1.0 cr)  
- BIOL 4312 - Advanced Topics in Molecular and Cellular Biology and Genetics (4.0 cr)  
- BIOL 4342 - Neuroscience (3.0 cr)  
- BIOL 4364 - Immunology (3.0 cr)  
- BIOL 4721 - Special Topics in the Life Sciences (1.0 - 4.0 cr)  
- CHEM 2231 - Organic Chemistry II [PHYS] (4.0 cr)  
- CHEM 2333 - General Chemistry II (4.0 cr)  
- CHEM 4331 - Chemical Biology/Bioorganic Chemistry (3.0 cr)  
- CHEM 4721 - Special Topics in Chemistry (1.0 - 4.0 cr)  
- CLI 1393 - Directed Study (1.0 - 3.0 cr)  
- CLI 3390 - Undergraduate Seminar (1.0 cr)  
- CLI 3393 - Directed Study (1.0 - 3.0 cr)  
- CLI 3394 - Directed Research (1.0 - 6.0 cr)  
- CLI 3496 - Internship: Professional Experience (1.0 - 6.0 cr)  
- CLI 3950 - Special Topics (1.0 - 3.0 cr)  
- CLI 4950 - Special Topics (1.0 - 3.0 cr)  
- HP 3021 - Patient Care Techniques (1.0 cr)  
- HP 4902 - Management and Leadership in Healthcare [GP] (2.0 cr)  
- HUM 3437 - History and Philosophy of Science [HIS, TS] (3.0 cr)  
- HUM 3441 - Ethics of Medicine and the Sciences [AH, CIV] (3.0 cr)  
- HUM 3471 - Literatures of Diversity [DSJ] (3.0 cr)  
- HUM 4721 - Special Topics in the Life Sciences (1.0 - 4.0 cr)  
- MATH 2171 - Calculus, Modeling, and Data II [MATH] (3.0 cr)  
- MATH 4721 - Special Topics in the Mathematical Sciences (1.0 - 4.0 cr)  
- PHYS 2251 - Physics II [PHYS] (4.0 cr)  
- PSY 3511 - Human Development across the Lifespan (3.0 cr)  
- PSY 3512 - Principles of Abnormal Psychology (3.0 cr)  
- PUBH 3561 - Environmental Health and Environmental Justice [ENV, SOCS] (3.0 cr)  
- PUBH 4561 - Introduction to Epidemiology: Research and Data Exploration (3.0 cr)  
- RESP 3502 - Clinical Research: Literature, Methodology, and Application (3.0 cr)  
- SOC 3531 - Health Policy in a Global Context [GP, SOCS] (3.0 cr)  
- SOC 3571 - Drugs and Society [DSJ, SOCS] (3.0 cr)  
- SOC 3581 - Medical Sociology and Technology [SOCS, TS] (3.0 cr)  
- SOC 4721 - Special Topics in Sociology (1.0 - 4.0 cr)  
- SPAN 2524 - Spanish IV (3.0 cr)  
- SPAN 4721 - Special Topics in Spanish (1.0 - 4.0 cr)