

Addendum II

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Doctor of Medicine (MD) Program Degree Plan

Phase I

Year 1 (75.5QH)

HIPS 515 Foundations for Interprofessional Practice (2QH)

MCBA 500 Clinical Anatomy (8.5QH)

MCMS 500 Clinical Foundations of Medicine (6QH)

MCMS 505 Infection, Immunology, & Hematology (9.5QH)

MCMS 510 Scientific Foundations of Medicine (10.5QH)

MCMS 515 Gastroenterology (8QH)

MCMS 520 Skin (3.5QH)

MCMS 525 Cardiovascular, Pulmonary, & Renal (15QH)

MCUR 502 Essentials of Clinical Reasoning I (7.5QH)

MMTD 509 Clinical Epidemiology (1.5QH)

MMTD 510 Bioethics (2QH)

MOSA 500 Clinical Reflections I (1.5QH)

Year 2 (56.5QH)

MCMS 600 Musculoskeletal (4QH)

MCMS 605 Neurobehavioral Health (19.5QH)

MCMS 610 Endocrine & Reproductive (13QH)

MCMS 615 Multisystem (6.5QH)

MCUR 602 Essentials of Clinical Reasoning II (5.5QH)

MCUR 606 Clinical Skills (2QH)

MMTD 601 Patient Safety (2QH)

MOSA 600 Clinical Reflections II (1QH)

Electives (3QH)

Phase II

Year 3 (73QH)

MFPM 701 Family Medicine/Primary Care Clerkship (9QH)

MMED 700 Medicine Clerkship (12QH)

MNEU 700 Neurology Clerkship (6QH)

MOBG 700 Obstetrics/Gynecology Clerkship (9QH)

MOSA 700 Clinical Reflections III (1QH)

MPED 700 Pediatrics Clerkship (9QH)
MPSY 700 Psychiatry Clerkship (9QH)
MSUR 700 Surgery Clerkship (12QH)
Electives: 4-weeks (6QH)

Phase III

Year 4 (54.5QH)

MCCR 898 Transition to Internship (1QH)
MOSA 805 Clinical Reflections IV (1QH)

Take one of the following 4-week Sub-Internships (6QH):

MEMG 800 Emergency Medicine Sub-Internship
MFPM 805 Family Medicine Sub-Internship
MMED 800 Internal Medicine Sub-Internship
MPED 805 Pediatrics Sub-Internship

31 weeks Electives (46.5QH):

12 weeks minimum intramural CMS electives
19 weeks maximum extramural electives
8 weeks maximum non-clinical electives
12 weeks maximum in any single specialty (except medicine or pediatrics)

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Doctor of Nursing Practice (DNP) Program Degree Plan

36-Month, Entry-Level Doctor of Nursing Practice Program of Study (RN BS to DNP)

Year 1 (57QH)

HIPS 515 Foundations of Interprofessional Practice (2QH)
HNAS 698 Scholarly Writing (2QH)
HNAS 701 Principles of Anesthesia I (6QH)
HNAS 710 Chemistry and Physics in Anesthesia (2QH)
HNAS 711 Clinical Correlations I (2QH)
HNAS 720 Advanced Nurse Anesthesia Pharmacology I (2QH)
HNAS 725 Advanced Health Assessment (4QH)
HNAS 750 Advanced Physiology, Pathophysiology, and Pharmacology I (6QH)
HNAS 751 Advanced Physiology, Pathophysiology, and Pharmacology II (6QH)
HNAS 901 Translational Research I (3QH)
HNAS 902 Translational Research II (3QH)
HNAS 906 Organizational Theory/Leadership and Management in Healthcare (3QH)
HNAS 903 Health Policy (3QH)
HNAS 909 Economics and Finance in Healthcare (3QH)
MCBA 501 Clinical Anatomy (10 QH)

Year 2 (60QH)

HNAS 702 Principles of Anesthesia II (6QH)
HNAS 703 Principles of Anesthesia III (5QH)
HNAS 712 Clinical Correlations II (2QH)
HNAS 713 Clinical Correlations III (2QH)
HNAS 714 Clinical Seminar I (1QH)
HNAS 715 Clinical Seminar II (1QH)
HNAS 721 Advanced Nurse Anesthesia Pharmacology II (2QH)
HNAS 722 Advanced Nurse Anesthesia Pharmacology III (2QH)
HNAS 810 Clinical Residency I (12QH)
HNAS 820 Clinical Residency II (12QH)
HNAS 904 Entry-Level Doctoral Project Planning I (2QH)
HNAS 905 Entry-Level Doctoral Project Planning II (2QH)
HNAS 907 Quality and Safety/Outcomes Management (3QH)
HNAS 911 Professional Dissemination Skills (2QH)
HNAS 921 Entry-Level Doctoral Immersion Residency I (3QH)
HNAS 922 Entry-Level Doctoral Immersion Residency II (3QH)

Year 3 (60QH)

HNAS 716 Clinical Seminar III (1QH)
HNAS 717 Clinical Seminar IV (1QH)
HNAS 718 Clinical Seminar V (1QH)
HNAS 719 Clinical Seminar VI (1QH)
HNAS 830 Clinical Residency III (10QH)
HNAS 840 Clinical Residency IV (12QH)
HNAS 850 Clinical Residency V (12QH)
HNAS 860 Clinical Residency VI (11 QH)
HNAS 913 Professional Role Transition (1QH)
HNAS 923 Entry-Level Doctoral Immersion Residency III (4QH)
HNAS 931 Entry-Level Doctoral Project I (3QH)
HNAS 932 Entry-Level Doctoral Project II (3QH)

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Doctor of Nursing Practice (DNP) Graduation Requirements

- Total quarter hours required for Entry-Level Degree: 177

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Population Health (MS) Program Degree Plan

Core Courses (39QH)

HHCM 515 Healthcare Law (3QH)
HHCM 516 Risk and Quality Management in Healthcare (3QH)
HHCM 517 Management Ethics (3QH)
HHCM 520 Cultural Diversity and the Management of Healthcare (3QH)
HHCM 522 Healthcare Policy and Delivery Systems (4QH)
HHCM 630 Public Health Epidemiology (4QH)
HIPS 561 Statistics for Health Professions (4QH)
HPOP 530 Research Methodology I (3QH)
HPOP 540 Essentials of Population Health (3QH)
HPOP 541 Community Health Assessment and Intervention (3QH)
HPOP 590 Population Health Field Research Capstone Course (3QH)
HPOP 535 Health Economics, Policy and Advocacy (3QH)
OR
HNAS 909 Economics and Finance in Healthcare (3QH)

Electives (6QH)

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Population Health (MS) Graduation Requirements

- Successful completion of a minimum of 45 quarter hours
 - 36 quarter hours of core courses
 - 6 quarter hours of elective courses
 - 3 quarter hours for the final portfolio course

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Doctor of Pharmacy (PharmD) Program Degree Plan

Year 1 (51QH)

HIPS 515 Foundations for Interprofessional Practice (2QH)
YPHP 500 Introduction to Pharmacy Practice (1QH)
YPHP 502 Introduction to Drug Information Resources (1QH)
YPHP 505 Research and Statistics (2QH)
YPHP 506 Pharmacy Skills Lab I (3QH)

YPHP 507 Pharmacy Skills Lab II (3QH)
YPHP 508 Pharmacy Skills Lab III (2QH)
YPHP 510 Self-Care and Non-Prescription Medications (3QH)
YPHP 511 Pharmacy-Based Immunization Delivery (1QH)
YPHP 515 Introductory Pharmacy Practice Experience (6QH)
YPHP 519 Pathophysiology I (2QH)
YPHP 520 Pathophysiology II (2QH)
YPHS 501 Pharmaceutics I: Introduction to Pharmaceutical Sciences (3QH)
YPHS 502 Pharmaceutics II: Dosage Forms (2QH)
YPHS 503 Pharmaceutical Calculations (3QH)
YPHS 504 Biochemical Principles for Pharmacy I (2QH)
YPHS 506 Medicinal Chemistry (2QH)
YPHS 510 Fundamentals in Physiology I (4QH)
YPHS 511 Fundamentals in Physiology II (3QH)
YPHS 512 Biochemical Principles for Pharmacy II (2QH)
YPHS 514 Fundamentals of Pharmacology (2QH)

Year 2 (52QH)

MMTD 510 Bioethics (2QH)
YPHP 504 Health Care Systems (2QH)
YPHP 604 Clinical Pharmacokinetics and Pharmacodynamics (2QH)
YPHP 606 Pharmacy Skills Lab IV (3QH)
YPHP 607 Pharmacy Skills Lab V (3QH)
YPHP 608 Pharmacy Skills Lab VI (3QH)
YPHP 615 Introductory Pharmacy Practice Experience (5QH)
YPHP 620 Pharmacotherapy I (4QH)
YPHP 621 Pharmacotherapy II (4QH)
YPHP 622 Pharmacotherapy III (4QH)
YPHP 625 Applications of Drug Information (1QH)
YPHP 630 Gateway to Patient-Centered Care (1QH)
YPHS 509 Pharmaceutical Non-Sterile Compounding (1QH)
YPHS 600 Basic Pharmacokinetics and Pharmacodynamics (3QH)
YPHS 610 Advanced Medicinal Chemistry I (1.5QH)
YPHS 611 Advanced Medicinal Chemistry II (1.5QH)
YPHS 612 Advanced Medicinal Chemistry III (1QH)
YPHS 620 Life-Long Learning Seminar (1QH)
YPHS 625 Pharmacology I (2.5QH)
YPHS 626 Pharmacology II (2QH)
YPHS 627 Pharmacology III (2.5QH)
YPHS 709 Epidemiology (2QH)

Year 3 (39.5QH)

YPHP 703 Pharmacy Management and Leadership (2QH)
YPHP 706 Pharmacy Skills Lab VII (2QH)
YPHP 707 Pharmacy Skills Lab VIII (2QH)
YPHP 708 Pharmacy Skills Lab IX (1QH)

YPHP 709 Health Care and Pharmacy Law (3QH)
YPHP 710 Pharmacotherapy IV (3QH)
YPHP 711 Pharmacotherapy V (4QH)
YPHP 712 Pharmacotherapy VI (3QH)
YPHP 713 Pharmacogenomics (2QH)
YPHP 714 Pharmacoeconomics (2QH)
YPHP 715 Introductory Pharmacy Practice Experience (3.5QH)
YPHP 716 Interprofessional Case Collaborations (3QH)
YPHP 719 Gateway to Clinical Practice (2QH)
YPHS 720 Life-Long Learning Seminar (1QH)
Electives (6QH)

Year 4 (58QH)

YPHP 800 Practical Approaches to Professional Development (4QH)
YPHP 801 Advanced Pharmacy Practice Experience – Acute Care (9QH)
YPHP 802 Advanced Pharmacy Practice Experience – Ambulatory Care (9QH)
YPHP 803 Advanced Pharmacy Practice Experience – Community Pharmacy (9QH)
YPHP 804 Advanced Pharmacy Practice Experience – Health-Systems (9QH)
and two electives (18QH total) from one or both of the following:
YPHP 805 Advanced Pharmacy Practice Experience – Patient Care Elective (9QH)
YPHP 806 Advanced Pharmacy Practice Experience – Non-Patient Care Elective (9QH)

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School of Graduate and Postdoctoral Studies: Degree Plans

Biochemistry and Molecular Biology (MS)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)
GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*
GIGP 509 Biostatistics (1QH)
GIGP 510 Computer Applications in Biomedical Research (1QH)
GIGP 518 Writing Skills (1QH)

Advanced Coursework:

GBCH 543 Enzyme Structure and Mechanism (3QH)
GBCH 544 Physical Biochemistry (3QH)
GBCH 600 Biochemical Pathways (9QH)
Additional advanced coursework if indicated by Research Committee

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GBCH 532 Biochemistry and Molecular Biology Journal Club (1QH per academic year)

GBCH 533 Biochemistry and Molecular Biology Seminar (1QH per academic year)

Research/Thesis:

Students must take the following course every quarter that they are enrolled after selection of specific degree program:

GBCH 530 Master's Thesis in Biochemistry (10-12QH per quarter)

Biochemistry and Molecular Biology (PhD)

Core Courses:

GIGP 500 First-Year Lab Rotations (32QH)

GIGP 501 Molecular Cell Biology I (5QH)

GIGP 502 Molecular Cell Biology II (5QH)

GIGP 503 Systems Lectures (4QH)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)

GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*

GIGP 509 Biostatistics (1QH)

GIGP 510 Computer Applications in Biomedical Research (1QH)

GIGP 518 Writing Skills (1QH)

Other GIGP Courses:

GIGP 505 Cellular and Molecular Developmental Biology (4QH)

Advanced Coursework:

GBCH 543 Enzyme Structure and Mechanism (3QH)

GBCH 544 Physical Biochemistry (3QH)

GBCH 600 Biochemical Pathways (9QH)

Additional advanced coursework as indicated by Research Committee

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GBCH 532 Biochemistry and Molecular Biology Journal Club (1QH per academic year)

GBCH 533 Biochemistry and Molecular Biology Seminar (1QH per academic year)

Dissertation Research:

Students must take one of the following courses every quarter that they are enrolled after selection of specific degree program:

GBCH 599 Pre-Candidacy Research Activities (10-12QH per quarter)

OR

GBCH 699 Post-Candidacy Doctoral Research Activities (10-12QH per quarter)

Cell Biology and Anatomy (MS)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)

GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*

GIGP 509 Biostatistics (1QH)

GIGP 510 Computer Applications in Biomedical Research (1QH)

GIGP 518 Writing Skills (1QH)

Advanced Coursework:

GIGP 501 Molecular-Cell Biology I (5QH)

Additional advanced coursework if indicated by Research Committee

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GCBA 532 Cell Biology and Anatomy Journal Club (1QH per academic year)

GCBA 533 Cell Biology and Anatomy Seminar (1QH per academic year)

Research/Thesis:

Students must take the following course every quarter that they are enrolled after selection of specific degree program:

GCBA 530 Master's Thesis in Cell Biology and Anatomy (10-12QH per quarter)

Cell Biology and Anatomy (PhD)

Core Courses:

GIGP 500 First-Year Lab Rotations (32QH)

GIGP 501 Molecular Cell Biology I (5QH)

GIGP 502 Molecular Cell Biology II (5QH)

GIGP 503 Systems Lectures (4QH)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)

GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*

GIGP 509 Biostatistics (1QH)
GIGP 510 Computer Applications in Biomedical Research (1QH)
GIGP 518 Writing Skills (1QH)

Other GIGP Courses:

GIGP 505 Cellular and Molecular Developmental Biology (4QH)

Advanced Coursework:

GCBA 600 Advanced Cell Biology (1QH)
GBCA 604 Techniques in Cell Biology (2QH)
Additional advanced coursework as indicated by Research Committee

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)
Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:
GCBA 532 Cell Biology and Anatomy Journal Club (1QH per academic year)
GCBA 533 Cell Biology and Anatomy Seminar (1QH per academic year)

Dissertation Research:

Students must take one of the following courses every quarter that they are enrolled after selection of specific degree program:

GCBA 599 Pre-Candidacy Research Activities (10-12QH per quarter)
OR
GCBA 699 Post-Candidacy Doctoral Research Activities (10-12QH per quarter)

Cellular and Molecular Pharmacology (MS)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)
GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*
GIGP 509 Biostatistics (1QH)
GIGP 510 Computer Applications in Biomedical Research (1QH)
GIGP 518 Writing Skills (1QH)

Advanced Coursework:

If indicated by Research Committee

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:
GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GCMP 502 Journal Club in Cellular and Molecular Pharmacology (1QH per academic year)

GCMP 509 Seminars in Cellular and Molecular Pharmacology (1QH per academic year)

Research/Thesis:

Students must take the following course every quarter that they are enrolled after selection of specific degree program:

GCMP 599 Pre-Candidacy Research Activities (10-12QH per quarter)

Cellular and Molecular Pharmacology (PhD)

Core Courses:

GIGP 500 First-Year Lab Rotations (32QH)

GIGP 501 Molecular Cell Biology I (5QH)

GIGP 502 Molecular Cell Biology II (5QH)

GIGP 503 Systems Lectures (4QH)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)

GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*

GIGP 509 Biostatistics (1QH)

GIGP 510 Computer Applications in Biomedical Research (1QH)

GIGP 518 Writing Skills (1QH)

Other GIGP Courses:

GIGP 512 Neuroscience (5QH)

GIGP 516 Physiology for Neuro-Pharm Research (3QH)

Advanced Coursework:

GCMP 601 Neuropharmacology I (1QH)

GCMP 602 Neuropharmacology II (1QH)

GCMP 605 Pharmacology Core (6QH)

GCMP 700 Teaching in Pharmacology (1QH)

Additional advanced coursework as indicated by Research Committee

Electives (1QH minimum):

students must choose at least one of the following:

GNSC 600 Neuronal Physiology and Signaling (2QH)

GNSC 606 Neurodegeneration (1QH)

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GCMP 502 Journal Club in Cellular and Molecular Pharmacology (1QH per academic year)

GCMP 509 Seminars in Cellular and Molecular Pharmacology (1QH per academic year)

Dissertation Research:

Students must take one of the following courses every quarter that they are enrolled after selection of specific degree program:

GCMP 599 Pre-Candidacy Research Activities (10-12QH per quarter)

OR

GCMP 699 Post-Candidacy Doctoral Research Activities (10-12QH per quarter)

Microbiology and Immunology (MS)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)

GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*

GIGP 509 Biostatistics (1QH)

GIGP 510 Computer Applications in Biomedical Research (1QH)

GIGP 518 Writing Skills (1QH)

Advanced Coursework:

If indicated by Research Committee

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GMIC 532 Microbiology and Immunology Journal Club (1QH per academic year)

GMIC 533 Seminar in Microbiology and Immunology (1QH per academic year)

Research/Thesis:

Students must take the following course every quarter that they are enrolled after selection of specific degree program:

GMIC 530 Master's Thesis in Microbiology and Immunology (10-12QH per quarter)

Microbiology and Immunology (PhD)

Core Courses:

GIGP 500 First-Year Lab Rotations (32QH)

GIGP 501 Molecular Cell Biology I (5QH)

GIGP 502 Molecular Cell Biology II (5QH)

GIGP 503 Systems Lectures (4QH)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)
GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*
GIGP 509 Biostatistics (1QH)
GIGP 510 Computer Applications in Biomedical Research (1QH)
GIGP 518 Writing Skills (1QH)

Other GIGP Courses:

GIGP 505 Cellular and Molecular Developmental Biology (4QH)

Advanced Coursework:

GMIC 600 Medical Microbiology and Immunology I (3QH)
GMIC 601 Medical Microbiology and Immunology II (2QH)
GMIC 605 Molecular Biology Techniques (2QH)
Additional advanced coursework as indicated by Research Committee

Electives (4QH minimum):

students must choose at least two of the following:

GMIC 503 Virology (4QH)
GMIC 560 Advanced Immunology (3QH)
GMIC 606 Cancer Biology and Signaling (1QH)

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)
Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:
GMIC 532 Microbiology and Immunology Journal Club (1QH per academic year)
GMIC 533 Seminar in Microbiology and Immunology (1QH per academic year)

Dissertation Research:

Students must take one of the following courses every quarter that they are enrolled after selection of specific degree program:

GMIC 599 Pre-Candidacy Research Activities (10-12QH per quarter)
OR
GMIC 699 Post-Candidacy Doctoral Research Activities (10-12QH per quarter)

Neuroscience (MS)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)
GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*
GIGP 509 Biostatistics (1QH)
GIGP 510 Computer Applications in Biomedical Research (1QH)
GIGP 518 Writing Skills (1QH)

Advanced Coursework:

If indicated by Research Committee

Repeated Courses (Regular Neuroscience Track):

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GNSC 504 Neuroscience Seminar (1QH per academic year)

GNSC 553 Neuroscience Journal Club (1QH per academic year)

Repeated Courses (Neuropharmacology Track):

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GCMP 502 Journal Club in Cellular and Molecular Pharmacology (1QH per academic year)

GCMP 509 Seminars in Cellular and Molecular Pharmacology (1QH per academic year)

Research/Thesis:

Students must take the following course every quarter that they are enrolled after selection of specific degree program:

GNSC 599 Pre-Candidacy Research Activities (10-12QH per quarter)

Neuroscience (PhD)

Core Courses:

GIGP 500 First-Year Lab Rotations (32QH)

GIGP 501 Molecular Cell Biology I (5QH)

GIGP 502 Molecular Cell Biology II (5QH)

GIGP 503 Systems Lectures (4QH)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)

GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*

GIGP 509 Biostatistics (1QH)

GIGP 510 Computer Applications in Biomedical Research (1QH)

GIGP 518 Writing Skills (1QH)

Other GIGP Courses:

GIGP 512 Neuroscience (5QH)

GIGP 516 Physiology for Neuro-Pharm Research (3QH)

Regular Neuroscience Track

Advanced Coursework:

GCMP 601 Neuropharmacology I (1QH)
GCMP 602 Neuropharmacology II (1QH)
GNSC 505 Human Brain Dissection (1QH)
GNSC 570 Principles and Practice in Neuroscience Teaching (2QH)
GNSC 600 Neuronal Physiology and Signaling (2QH)
GNSC 605 Techniques in Microscopy (1QH)
GNSC 606 Neurodegeneration (1QH)

Additional advanced coursework as indicated by Research Committee

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GNSC 504 Neuroscience Seminar (1QH per academic year)

GNSC 553 Neuroscience Journal Club (1QH per academic year)

OR Neuropharmacology Track

Advanced Coursework:

GCMP 601 Neuropharmacology I (1QH)
GCMP 602 Neuropharmacology II (1QH)
GCMP 605 Pharmacology Core (6QH)
GCMP 700 Teaching in Pharmacology (1QH)
GNSC 600 Neuronal Physiology and Signaling (2QH)
GNSC 606 Neurodegeneration (1QH)

Additional advanced coursework as indicated by Research Committee

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GCMP 502 Journal Club in Cellular and Molecular Pharmacology (1QH per academic year)

GCMP 509 Seminars in Cellular and Molecular Pharmacology (1QH per academic year)

Dissertation Research:

Students must take one of the following courses every quarter that they are enrolled after selection of specific degree program:

GNSC 599 Pre-Candidacy Research Activities (10-12QH per quarter)

OR

GNSC 699 Post-Candidacy Doctoral Research Activities (10-12QH per quarter)

Physiology and Biophysics (MS)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)
GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*
GIGP 509 Biostatistics (1QH)
GIGP 510 Computer Applications in Biomedical Research (1QH)
GIGP 518 Writing Skills (1QH)

Advanced Coursework:

GPHY 522 Topics in Physiology (6QH)
Additional advanced coursework if indicated by Research Committee

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)
Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:
GPHY 505 Physiology and Biophysics Seminar (1QH per academic year)
GPHY 711 Physiology and Biophysics Journal Club (1QH per academic year)

Research/Thesis:

Students must take the following course every quarter that they are enrolled after selection of specific degree program:
GPHY 620 Master's Research in Physiology (10-12QH per quarter)

Physiology and Biophysics (PhD)

Core Courses:

GIGP 500 First-Year Lab Rotations (32QH)
GIGP 501 Molecular Cell Biology I (5QH)
GIGP 502 Molecular Cell Biology II (5QH)
GIGP 503 Systems Lectures (4QH)

Specialty Courses:

GIGP 507 Art of Scientific Presentations (2QH)
GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1QH) – *every five years*
GIGP 509 Biostatistics (1QH)
GIGP 510 Computer Applications in Biomedical Research (1QH)
GIGP 518 Writing Skills (1QH)

Other GIGP Courses:

GIGP 506 Systems Physiology (6QH)

Advanced Coursework:

GPHY 500 Medical Physiology (14QH)

GPHY 534 Teaching Methods (4QH)

Additional advanced coursework as indicated by Research Committee

Repeated Courses:

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled:

GMTD 709 Molecular and Cellular Sciences Seminar Series (1QH per academic year)

Students must take the following courses every Fall, Winter, and Spring quarter that they are enrolled after selection of specific degree program:

GPHY 505 Physiology and Biophysics Seminar (1QH per academic year)

GPHY 711 Physiology and Biophysics Journal Club (1QH per academic year)

Dissertation Research:

Students must take one of the following courses every quarter that they are enrolled after selection of specific degree program:

GPHY 599 Pre-Candidacy Research Activities (10-12QH per quarter)

OR

GPHY 699 Post-Candidacy Doctoral Research Activities (10-12QH per quarter)

Course Descriptions

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Remove course description for GBCH 531 and GBCH 550

GBCH 530 Master's Thesis in Biochemistry (10-12 QH)

After completing coursework, the student writes the research thesis.

GBCH 543 Enzyme Structure and Mechanism (3 QH)

This is a course of lectures, student presentations and seminars by outside speakers on aspects of enzymology. The following subjects are covered: protein sequence methodology, X-ray crystallography, computer graphic modeling, chemical and enzyme kinetics including regulatory kinetics, enzyme mechanisms, chemical modification of enzymes and site-directed mutagenesis.

GBCH 544A & B Physical Biochemistry (3 QH)

This course deals with the physical chemical properties of biological macromolecules and the techniques used for their characterization. Topics include: molecular weight, hydrodynamic properties and spectroscopic properties of proteins and nucleic acids; secondary structure, tertiary structure and conformational changes of proteins; dynamics of protein-protein and protein-DNA interactions; and kinetics and thermodynamics of protein folding.

GBCH 600A & B Biochemical Pathways (9 QH)

The fundamental chemical properties and biological reactions of the various compounds important to the normally functioning human organism are studied. As far as possible, mechanisms of life processes at the cellular and molecular level are explained in terms of these properties.

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Remove course description for GCBA 602

GCBA 530 Master's Thesis in Cell Biology and Anatomy (10-12 QH)

After completing coursework, the student writes the research thesis.

GCBA 532 Cell Biology and Anatomy Journal Club (1 QH)

Presentations on current literature or personal research by faculty, staff and students.

GCBA 533 Cell Biology and Anatomy Seminar (1 QH)

Presentations on current research by invited speakers.

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GGRD 700 Teaching Scholar (1 QH)

Graduate research may be conducted, with Dean's Office, Departmental and Mentor approval, at a university or facility outside of RFUMS. Students remain enrolled in the School of Graduate and Postdoctoral Studies, while receiving credit for their work in an external research facility.

GIGP 500 First-Year Lab Rotations (8 QH)

First-year IGPBS students complete four self-selected laboratory rotations with research faculty. These approximately eight-week rotations are designed to introduce student and mentor in the laboratory setting with the goal of determining student/mentor match. At the end of the rotations, the student will select their dissertation advisor from among those faculty members with whom the rotations were held.

GIGP 501 Molecular Cell Biology I (5 QH)

In this course, the molecular and cellular processes common to all eukaryotic cells are studied and, where appropriate, comparisons to prokaryotic cells are made. The molecular and cellular processes of specific cell types and tissue types are also considered.

GIGP 502 Molecular Cell Biology II (5 QH)

A continuation and expansion of the principles taught in Molecular-Cell Biology I, this course covers the following topics: protein structure and molecular recognition, enzyme action and adaptation principles of biomolecular action and regulation receptors, signal transduction, gene expression – pre-mRNA to targeted protein degradation, antibodies-structure and function, and current methods of cell biology.

GIGP 503 Systems Lectures (4 QH)

The Systems Lectures are a series of weeklong modules, each focused on a particular disease and take the student from the disease's primary underlying mechanism (at the cellular level or gene level, if known) to the integrated, physiological systems level. The modules are a combination of lectures and/or directed paper discussions by faculty with expertise in a particular disease area.

GIGP 505 Cellular and Molecular Developmental Biology (4 QH)

Students must take a minimum of one elective option in their first year. This course will introduce the students to the prominent experimental model systems used today by developmental biologists and then focus on particular underlying developmental control mechanisms that are important to the processes of cell differentiation and morphogenesis. The course is comprised of a combination of lectures and/or directed paper discussions by faculty with expertise in the various sub-topics of the course. This course is required for those students wishing to pursue studies in the Biochemistry and Molecular Biology, Cell Biology and Anatomy or Microbiology and Immunology Programs.

GIGP 506 Systems Physiology (6 QH)

Students must take a minimum of one elective in their first year. The Systems Physiology elective includes the study of: cardiac, respiratory, renal, gastrointestinal and endocrine

physiology. It is designed for graduate students who have successfully completed Molecular and Cell Biology I and II, but require a more complete understanding of organ-systems physiology. This course is required for those students wishing to pursue studies in the Physiology and Biophysics programs. Those students studying toward the PhD degree with an advisor in Physiology and Biophysics will be required to complete the full course in Medical Physiology GPHY 500.

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GIGP 507 The Art of Scientific Presentations (2 QH)

Students learn to improve their oral presentation skills by weekly presentations and by giving and receiving peer evaluation. The successful scientific career requires clear communication of scientific results. Participants in this course practice giving and evaluating oral presentations of technical material. Topics to be covered include organization of a talk, targeting the material to the appropriate level of the audience, overcoming “stage fright,” effective visual aids, developing eye contact, effective use of voice, overcoming language barriers and handling question-and-answer sessions.

GIGP 508 Ethics and Regulatory Issues in Biomedical Research (1 QH)

This course covers the major issues related to the responsible conduct of research in the biomedical sciences, including: overt falsification, fabrication, plagiarism (FFP); authorship and peer-review guidelines; conflict of interest; mentor/trainee responsibilities; research with animal subjects; and human subject research. Online components include certification for using radioisotopes and working with vertebrate animal and human subjects.

GIGP 509 Biostatistics (1 QH)

Study of descriptive and inferential statistics with relevance to research will be included. Use of the computer for statistical analysis will be covered. There will be an opportunity to use statistics for a small pilot project.

GIGP 510 Computer Applications in Biomedical Research (1 QH)

Combination of lecture and hands-on application of computer databases and tools to research problems.

GIGP 512 Neuroscience (5 QH)

IGPBS students must take a minimum of one elective in their first year. This course, which is required for entry into both the Neuroscience and Pharmacology PhD programs, is divided into lecture and laboratory parts. Topics to be covered in the lecture portion include: the neurochemistry of transmitters, receptors and second messenger systems; developmental neurobiology; and the neural systems underlying sensory, motor, affect, memory, language and other high cognitive functions. The laboratory portion is focused on human neuroanatomy, and is taught through a combination of large-group lectures, wet labs and small discussion sessions, employing a mixture of atlases, brain models, cadaver brains and interactive computer programs. Students enrolled in this elective also must enroll in either the spring term Physiology for Neuro-Pharm Research (GIGP 516) or the Systems Physiology (GIGP 506) elective.

GIGP 516 Physiology for Neuro-Pharm Research (3 QH)

Elective supplement for IGPBS. Neuroscience elective. The topics reviewed in this course provide a complementary body of knowledge for students pursuing research in biomedical sciences disciplines other than physiology and biophysics. Topics include a basic overview of both general and muscle physiology, the autonomic nervous system and calcium regulation. Select topics integral to general biomedical science study are also reviewed.

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GIGP 700 SGPS Research Externship (10-12 QH)

Graduate research may be conducted, with Dean's Office, Departmental and Mentor approval, at a university or facility outside of RFU. Students remain enrolled in the School of Graduate and Postdoctoral Studies, while receiving credit for their work in an external research facility.

GMIC 530 Master's Thesis in Microbiology and Immunology (10-12 QH)

After completing coursework, the student writes the research thesis.

GMIC 532 Microbiology and Immunology Journal Club (1 QH)

Faculty, postdoctoral fellows and students discuss current research efforts. Participants present their "work in progress" in an informal presentation, which includes an introduction to the field of interest. This series covers topics of research currently being pursued in the discipline, and is geared toward learning of each other's work and assisting one another in defining science and presentation skills.

GMIC 533 Seminar in Microbiology and Immunology (1 QH)

Presentations on current research in the field of Microbiology and Immunology by invited speakers, faculty and students.

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GMIC 600 Medical Microbiology and Immunology I (3 QH)

This course consists of two parts: (1) lectures in immunology, basic bacteriology and pathogenic bacteria and (2) student's review, presentation and discussion of latest articles related to subjects of the lectures.

GMIC 601 Medical Microbiology and Immunology II (2 QH)

This course consists of two parts: (1) lectures in immunology, basic bacteriology and pathogenic bacteria and (2) student's review, presentation and discussion of latest articles related to subjects of the lectures.

GMTD 301 Cellular & Molecular Biology Lab for Veterans (1 QH)

This laboratory course teaches basic concepts of molecular and cellular biology using a molecular biology research project. The research project will introduce military veterans to standard genetic, cell biology and molecular biological techniques commonly used in a molecular biology lab, such as the Bradford assay, primer design, DNA isolation, gel-electrophoresis, transformation, tissue culture, transfection and western blot. The project will also provide students with hands-on understanding of bioinformatics tools for analyzing DNA sequences.

GMTD 709 Molecular and Cellular Sciences Seminar Series (1 QH)

Internationally known biomedical scientists provide exciting seminars for all who are interested in attending. Graduate students are also invited to attend a lunch with these visiting speakers.

GNSC 504 Neuroscience Seminar (1 QH)

Presentations on current research in the field of Neuroscience by invited speakers.

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Remove course description for GNSC 607

GNSC 553 Neuroscience Journal Club (1 QH)

Presentations on current literature, personal research and newsworthy developments in neuroscience by faculty, staff and students.

GNSC 570 Principles and Practice in Neuroscience Teaching (2 QH)

Prepare and lead weekly small-group sessions to help teach neuroanatomy to first-year medical students in the Medical Neuroscience Course (MNSC 502).

GNSC 600 Neuronal Physiology and Signaling (2 QH)

A thorough review of neurophysiological function, including the ionic basis of the neuronal membrane potential and action potentials, pre- and post-synaptic signaling, cable properties, integrative properties and synaptic plasticity.

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GPHY 620 Masters Research in Physiology (10-12 QH)

Research hours performed following submission and approval of a research project by the candidate's Thesis Committee.

GPHY 699 Post-Candidacy Doctoral Research Activities (10-12 QH)

This course is for the PhD student who has successfully passed the Candidacy Exam.

GPHY 711 Physiology and Biophysics Journal Club (1 QH)

Presentations on current literature or individual research projects by faculty and students.

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HPOP 530 Research Methodology I (3 QH)

This course exposes students to both quantitative and qualitative foundations of research methods. Students engage in projects where they apply theoretical principles in applied settings. Real-life limitations to traditional research when methods are utilized in applied settings are discussed. Students will be prepared to ask and answer basic research questions.

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HNAS 698 Scholarly Writing (2 QH)

This course prepares the student for graduate-level writing by providing online training in five key areas: (1) grammar & punctuation, (2) APA formatting, (3) critical analysis of text, (4) scholarly writing and (5) business writing. Students complete a series of modules in each content area. In all, there are over 200 modules that teach, develop, and evaluate capacity for scholarly writing and business writing. This course prepares the student to achieve the level of writing scholarship established by the Nurse Anesthesia program for the doctoral project.

HNAS 701 Principles of Anesthesia I (4 QH)

Basic principles of nurse anesthesia will be discussed, including: preoperative assessment (Interprofessional activities related to preoperative assessment of patients and patient optimization prior to surgery will be conducted with Podiatry students); the anesthesia machine and breathing circuits; airway management; monitoring; positioning; introduction to monitored anesthesia care, general anesthesia, and regional anesthesia (central neuraxial anesthesia techniques); quality and safety in anesthesia practice; and legal and historical aspects of nurse anesthesia practice. An overview of basic anesthesia pharmacology is presented through the integrated course content of HNAS 720. A hybrid approach of web-supported didactics augmented with weekly live review and case discussion sessions will be utilized.

HNAS 702 Principles of Anesthesia II (4 QH)

This course is for the student who has a foundation in the basic principles and practice of nurse anesthesia. During this quarter, students learn anesthetic management principles for surgical specialty areas. Important concepts include anatomic, physiologic, pathophysiologic, and pharmacologic principles associated with each covered disease state/specialty area of practice. The following surgical specialties are discussed in this course: neurosurgery, orthopedics, thoracic, endocrine, gynecologic, laparoscopic, renal/genitourinary, gastrointestinal, general, bariatric, organ transplant, trauma/burns, and eye/ear/nose/throat. In addition, content is provided regarding care of specific patient populations including geriatric patients, patients with cardiac disease, patients with hepatobiliary disease, and patients with endocrine disease and immune

system compromise. Students will be provided with the knowledge, skill and understanding to practice regional anesthesia safely and effectively. The principles and techniques involved in the administration and management of regional anesthesia and an introduction to pain pathways will be presented. Concepts of acute pain management will be presented in the context of the clinical application of these principles in nurse anesthesia practice.

HNAS 703 Principles of Anesthesia III (4 QH)

This course is for the student who has successfully completed HNAS 701-Principles of Anesthesia I, and HNAS 702-Principles of Anesthesia II. Content includes: 1) advanced anesthesia concepts including the care of patients undergoing cardiac and major vascular surgery; 2) anesthesia care for the pediatric patient--the neonate, infant and child; and 3) anesthesia care of the parturient patient. The principles and techniques involved in the administration and management of regional anesthesia in these patient populations will be discussed.

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MCMS 605A & B Neurobehavioral Health (19.5 QH)

Neurobehavioral Health covers the structure and function of the nervous system from biochemical to behavioral levels and the relationship of this biology to major neurological, psychiatric and special sense disorders including their presentations, differential diagnoses, and modes of treatment.

MCCR 606 Clinical Skills (2 QH)

Students will apply basic science and clinical knowledge in preparation for their clerkship rotations. Learning activities will include reading EKGs and radiological imaging, virtual, mannequin and standardized patient experiences, writing progress notes, practicing clinical procedures such as NG intubation, oxygen delivery, sterile scrubbing and gowning, foley catheterization; large group discussions and a small group evidence-based medicine presentation.

MCCR 808 Clinical Skills Course Elective (1.5-3 QH)

Clinical instruction of M2 students, facilitation of small groups and review of clinical experiences with individual students occur in this elective. M4 students review M2 performance in the OSCE experience, assist in writing SOAP notes, writing orders, presenting patients, suturing, and reading X-rays and EKGs.

MCCR 898 Transition to Internship (1 QH)

This one-week course uses high-fidelity simulation, interactive small group discussion, role play, and standardized patients to teach and assess many of the skills necessary to transition from M4 student to first-year resident.

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MELE 700 Third Year Extramural Elective (1.5-6 QH)

M3 elective opportunities are designed to supplement the required learning activities of the curriculum by allowing students to deepen their understanding of medical specialties, function at a more advanced level in preparation for residency training, care for a diverse patient population, and learn how health care is delivered in a variety of settings. Extramural electives offer students the opportunity to gain training and experience at another medical school or healthcare organization. Learning activities and assessment methods are specified by the host institution. Arrangements for an extramural elective are made between the student and host institution. Students must obtain administrative approval from the host institution and the Office of Student Affairs and Education.

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MMED 883 Epidemiology Experience in the Community – Lake County Health Department (3-6 QH)

This course is designed to provide the student with practical, applicable interprofessional learning experience in a dynamic environment, such as a local health department, for application in community-based outbreaks and other events of epidemiological significance. The skills and techniques addressed include, but are not limited to, educating the public on diseases and other threats of public health importance, contact tracing of affected persons, effective communication with healthcare providers, and implementation of preventative disease control measures. Students will observe how infectious disease specialists approach patients having suspected or confirmed infections and how clinical and public health professionals collaborate to address infectious and non-infectious threats.

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MNSC 700 Third Year Research (1.5-6 QH)

This elective provides students the opportunity to participate in research during the M3 year that is complementary to the student's overall medical school experience. Students who choose to do this elective are responsible for identifying a research advisor to provide guidance and supervision. The elective director will work with the research advisor to ensure that all relevant CMS policies and procedures (duty hours, student treatment, secure storage, exposure, etc.) are upheld. At the end of this elective, the M3 student will demonstrate knowledge of fundamental concepts of research, including ethics, literature review, obtaining data, and preparing or submitting for publication.

MNUT 504 Information and Health Literacy (3 QH)

This course introduces students to the skills and techniques needed to become an information-literate individual. Students will have the opportunity to acquire and practice the following: identifying the topic of interest or developing a research question; acquiring knowledge through the efficient use of current technologies, such as online and electronic resources; establishing evaluation criteria for information resources; evaluating and integrating the acquired information to answer the original query/research question, while complying with copyright laws/guidelines and effectively communicating this information, through an appropriate medium, to the target audience in an ethical and legal manner. In addition, students will explore the impact of health literacy on patient care and health outcomes and will acquire the skills needed to assist them in translating information about diseases and their treatments into a language that healthcare consumers can understand.

MNUT 505 Communication Strategies, Methods and Techniques (3 QH)

This course targets strategies, methods and techniques to enhance the effectiveness of professional and client-centered communications. Translation of evidence-based science into layman's terms will be emphasized. Use of social media, media training and how to promote oneself as a nutrition professional will be included.

MNUT 506 Health Education Teaching Experience (1 QH)

The purpose of this course is to give the student the opportunity to experience a teaching role. Students will plan, deliver and evaluate a learning module in a prevention, health and/or wellness area of their choice.

MNUT 510 Modern Nutrition (3 QH)

This course provides an in-depth overview of human nutrition including the processes of digestion, absorption, transportation and excretion of food and nutrients; the structure, function, metabolism, requirements, deficiencies, and toxicities of protein, carbohydrate, fat, vitamins, minerals, trace minerals and ultra-trace minerals; and the fundamental principles of energy metabolism and fluid, electrolyte and acid-base balance.

MNUT 511 Nutrition in Chronic Disease (4 QH)

This course gives a clinical analysis of the pathophysiological and metabolic basis for nutritional management in the prevention and treatment of chronic diseases impacting the population, including diabetes, heart disease, obesity, cancer and osteoporosis.

MNUT 512 Leadership (3 QH)

This course offers the essential elements in developing leadership skills, strategic planning and team performance to support career development and professional leadership activity in health and wellness organizations. The essential elements will be explored within the dynamic evolving landscape of the U.S. healthcare delivery system.

MNUT 513 Health and Wellness Coaching (3 QH)

This course builds on basic counseling skills to include health coaching techniques. The student will learn how to take a guiding role in empowering clients to choose a healthy lifestyle. Acting as a client-centered health coach and empowering the clients to become the expert in determining

their own wellness goals and plans, the student will practice motivational interviewing and other techniques to reach these ends.

MNUT 526 Evaluating Research and Health Recommendations (4 QH)

This course introduces the fundamentals of the research process through the evaluation of published clinical research studies with the desired end result being the ability to critically analyze and interpret research findings and health recommendations. From an evidence-based perspective, students will select, interpret, analyze, synthesize and then summarize relevant research studies using peer-reviewed articles, write a brief literature review and develop a hypothesis for future investigation. A process for evidence-based review and analysis of current recommendations for management, treatment and prevention of disease will be introduced. This course also includes a journal club discussion in which weekly learning objectives are reinforced with practical and applicable examples from current scientific literature.

MNUT 532 Instructional Design for Health Education (3 QH)

This course is designed to provide the healthcare professional with educational skills and techniques for the classroom, the individual client and for continuing education programs. The skills and techniques addressed are: developing teaching materials to include learner assessment, creating learning objectives, designing student-focused teaching methods, assessing learning outcomes and evaluating the educational experience. This course will primarily focus on learning theories for the adult learner. The student will design a complete educational offering (teaching module).

MNUT 541 Prevention, Health Promotion and Wellness (3 QH)

This course explores health promotion for the individual and the community. This will be accomplished through implementing basic community health concepts of epidemiology, levels of prevention and risk assessment within the context of health promotion activities. Students will analyze their own personal health promotion needs and selected needs within a chosen community. Based on the standards outlined in Healthy People 2020, students will develop health promotion activities for community health problems of their choice based on an assessment of need. Students will develop, track and analyze an individual health promotion plan for themselves.

MNUT 542 Complementary Medicine and Dietary Supplements (3 QH)

This course is an overview of complementary and alternative medicine (CAM) that includes alternative medical systems, holistic, integrative, mind-body interventions and biologically based therapies including a variety of herbs and dietary supplements such as botanicals, vitamins and minerals. The regulatory policies relating to safety of the therapies will be discussed. An evidence-based process will be used to analyze associated benefits and regulatory concerns.

MNUT 554 Nutrition in Critical Care (3 QH)

This course offers an in-depth review of the theory and application of the forms and components of specialized nutrition support in the treatment of various disease conditions.

MNUT 555 Nutrition in the Lifecycle (3 QH)

This course is an overview of the nutritional requirements and concerns specific to the different stages of the lifecycle. Scientific evidence relating to nutritional recommendations will be applied to prevention, health promotion and wellness activities.

MNUT 576 Nutrition in Human Physical Performance (3 QH)

This course focuses on the role of nutrition in the physiological and metabolic responses of the body to a wide range of physical activity. Macronutrient, micronutrient and fluid needs associated with physical activity and the nutritional needs of special athletic populations will be addressed. Topics such as the role of physical activity in the prevention of disease and the promotion of health and wellness, the use of supplements in athletes and exercise prescription for health conditions will also be discussed.

MNUT 582 Independent Study (1-3 QH)

The independent study is an individualized learning experience designed to meet the specific educational needs of the student.

MNUT 596 Portfolio Evaluation (2-3 QH)

The Master of Science in Nutrition degree focuses on five competency areas: nutrition and health promotion knowledge, education, critical thinking and research evaluation, professional communication and leadership. Achievement of specific learning objectives in these areas of competency will be demonstrated by the student through development of artifacts during the course of their degree program. These artifacts will be part of a required portfolio that will be evaluated by the student and a faculty committee. By the end of the course, students will have compiled a final collection of artifacts with analysis and reflections for each. Portfolio Evaluation is the final degree requirement for all students in the Master of Science in Nutrition program. Students will enroll in this course after all other course requirements are completed. A modified portfolio will be prepared by students who did not prepare artifacts as part of the required coursework.

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MPHW 583 Independent Study in Health Promotion and Wellness (4 QH)

Students will apply concepts and skills gained through their coursework to the professional wellness environment in an approved, interprofessional leadership experience located within a business, institution or agency. The student is expected to complete a minimum of 120 hours within the setting, including the time needed for preliminary planning, implementing and reporting on the completed project. The final report of the completed project will be presented as part of the final Portfolio Evaluation.

MPHW 596 Portfolio Evaluation for Health Promotion and Wellness (3 QH)

The Master of Science in Health Promotion and Wellness degree focuses on five competency areas: application of prevention, health promotion and wellness knowledge; educating the individual, family and community on health issues; leadership in an interprofessional health and wellness environment; communicating effectively as a health professional; and demonstration of

critical thinking and research evaluation. Achievement of specific learning objectives in these areas of competency will be demonstrated by the student through completion of course projects. These projects will become part of an e-portfolio that will be evaluated by the student and a faculty committee. The portfolio course is the final degree requirement and capstone experience for all students in the Master of Science in Health Promotion and Wellness program.

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MRAD 820 Comprehensive Evaluation of Breast Imaging Interpretation and Procedural Techniques (3-6 QH)

This is a 2 or 4-week elective with the following objectives. At the conclusion of this rotation, CMS Medical Students will (a) have a comprehensive understanding of Breast Imaging Screening and Diagnostic techniques as well as radiology interpretation in women, inclusive of Digital Breast Tomosynthesis (DBT) as a primary screening methodology, Contrast Enhanced Breast MRI for both asymptomatic high risk surveillance and preoperative disease extent evaluation in patients with known neoplasm, the role of adjunct whole breast screening ultrasound in women with dense breasts, and screening pathways for women with increased lifetime risk of breast cancer, (b) have a detailed understanding of procedural techniques utilized in Breast Imaging for image guided breast biopsy, delineation of disease extent, and localization for surgical procedures, and (c) have a thorough understanding of evidence based literature substantiating various society guidelines in regards to breast imaging inclusive of ACR (American College of Radiology), ACOG (American College of Obstetrics and Gynecology), ASBrS (American Society of Breast Surgery), ACS (American Cancer Society), SBI (Society of Breast Imaging), among others.

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YPHP 630 Gateway to Patient-Centered Care (1 QH)

This course is a summative evaluation of student performance in a simulated environment and overall retention of selected topics from the pharmacy curriculum to date. Students will be required to perform self-directed review of exam content as there will not be any lectures as part of this course. The course is comprised of a P2 OSCE (objective structured clinical examination) simulated experience as well as a comprehensive written exam called the Clinical Sciences Achievement Test (P2 CSAT).

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YPHP 713 Pharmacogenomics (1 QH)

This course will provide an overview of molecular biology as it pertains to regulation of genetic information within the human body, with a focus on the types and sources of genetic variations and how these impact the clinical efficacy and toxicity of drugs currently utilized in practice.

Admittedly, the topic of pharmacogenomics is an evolving one and thus not fully realized in all aspects of pharmacy. Therefore students will learn from and about clinical application in more progressive specialty settings while identifying future implications for therapeutic, economic, and ethical perspectives across pharmacy as a whole.

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YPHS 504 Biochemical Principles for Pharmacy I (2 QH)

This course explores basic biochemistry as it relates to organ systems and disease. This includes the principles of the thermodynamics, kinetics, structure and regulation of biochemically significant molecules and their building blocks. Biochemical constructs (such as energy production, enzymes, membranes, DNA, RNA, proteins, anabolic and catabolic pathways, etc.) are discussed with respect to pharmaceutical treatment of human disease.

YPHS 509A, B & C Pharmaceutical Non-Sterile Compounding (1 QH)

Pharmaceutical compounding is designed to introduce students to the fundamental concepts and techniques involved in the extemporaneous compounding of non-sterile preparations. Accurate and effective pharmaceutical formulation is a key skill, which must be mastered by all student pharmacists.