College of Nursing

Program	Degree	Outcomes
Nursing https://nursing.cuanschutz.edu/academics/undergraduate-programs/bachelors-program/traditional-nursing-bachelors-program	BSN	1. Display novice, professional nursing leadership qualities to promote quality and safe care. 2. Engage in effective communication and collaboration in intra– and interdisciplinary teams across a variety of contexts. 3. Provide socially just, ethical, and inclusive care to diverse populations across the continuum of care. 4. Apply principles of healthcare informatics as a meaningful user of health information systems and technology. 5. Reference relevant theoretical frameworks to improve patient and population health outcomes across a range of settings. 6. Integrate evidence-based practice into patient-centered care using the nursing process across a range of settings. 7. Articulate how policy, advocacy, finance and regulatory environments influence healthcare delivery.
Nursing https://nursing.cuanschutz.edu/academics/graduate-programs/masters-dnp-phd/masters-program	MS	1. Participate in an interdisciplinary healthcare team as a leader and an active member to promote quality and safe care at the patient, family, population or system levels. 2. Develop a professional, ethical, caring and culturally sensitive approach when working with patients, families, populations or systems. 3. Integrate patient care technologies to improve patient, family, population or system outcomes. 4. Use theoretical frameworks to address patient, family, population or system needs. 5. Integrate evidence-based knowledge into managing the care of patients, families, populations or systems to improve and protect health and wellness in Colorado and beyond. 6. Formulate strategies to advocate for patients, families, populations, systems or the nursing profession in Colorado and beyond.
Nursing https://nursing.cuanschutz.edu/academics/graduate-programs/masters-dnp-phd/doctor-of-philosophy-(phd)	Phd	1. Create new knowledge through the research process. 2. Demonstrates commitment to the profession through publications and conference presentations or engagement in professional organizations. 3. Examines multiple theories and methodologies for application to research problems. 4. Engages with fellow scientists and students in scholarly discourse. 5. Demonstrates ethical responsibility and action as a scientist. 6. Considers research findings relevant to public health and healthcare policy.

Nursing Practice https://nursing.cuanschutz.edu/academics/graduate-programs/masters-dnp-phd/doctor-of-nursing-degree	DNP	1. Lead interdisciplinary teams to improve the quality and safety of health care delivery strategies. 2. Formulate scientifically based, ethical, caring and culturally sensitive health care delivery strategies that meet current and future health care delivery system needs. 3. Integrate patient care technologies to evaluate complex health care questions in specific practice settings, populations or systems. 4. Integrate theoretical frameworks to guide the development and evaluation of health care delivery strategies. 5. Implement evidence and evaluate outcomes for the improvement of health in specific practice settings, populations or systems throughout Colorado and beyond. 6. Act as a health care policy advocate in Colorado and beyond.

Colorado School of Public Health

Program	Degree	Outcomes
Applied Biostatistics https://coloradosph.cuanschutz.edu/education/degrees-and-programs/master-of-public-health/mph-in-applied-biostatistics	MPH (track)	BIOS 1: Translate a study's scientific question or aims into testable statistical hypotheses and propose and apply appropriate statistical methods to test those hypotheses. BIOS 2: Fit and interpret models for continuous outcome data (normal linear model), categorical outcome data (logistic regression), and time-to-event data (Cox regression). BIOS 3: Apply concepts of multiple regression, including confounding, statistical interactions, model selection, model fit, and regression diagnostics, in fitting and evaluating statistical models. BIOS 4: Apply scientific and statistical principles of sampling, bias, confounding, and sample size estimation to design or interpret basic public health or biomedical studies. BIOS 5: Use computer software for data management (data entry, access, and data manipulations), as well as for summarizing, analyzing and displaying research results. BIOS 6: Use the principles of hypothesis testing and estimation for population parameters to draw inferences from quantitative data and communicate orally and in writing those inferences and their statistical and scientific interpretation to non-statistical scientists.
Biostatistics https://coloradosph.cuanschutz.edu/education/degrees-and-programs/master-of-science/2-ms-in-applied-biostatistics	MS	BIOS 1: Carry out and explain calculations, derivations and proofs central to basic statistical theory, and explain their use and implications in applied statistical work. BIOS 2: Apply statistical concepts of basic study designs including bias, confounding and efficiency, and identify strengths and weaknesses of experimental and observational designs. BIOS 3: Carry out exploratory and descriptive analyses of complex data using standard statistical software and methods of data summary and visualization. BIOS 4: Carry out valid and efficient modeling, estimation, model checking and inference using standard statistical methods and software. BIOS 5: Carry out valid and efficient modeling, estimation, model checking and inference using standard statistical methods and software BIOS 6: Demonstrate basic skills necessary for collaborating with non-biostatistical scientists, including mapping study aims to testable hypotheses, carrying out basic power and sample size estimation and evaluation, and identifying appropriate design, modeling and analysis methods to address study hypotheses. BIOS 7: Communicate, orally and in writing, simple and complex statistical ideas, methods and results in non-technical terms appropriate for collaborator needs (e.g. preparation of analysis section of grant proposals and methods and results sections of manuscripts).

Biostatistics https://coloradosph.cuanschutz.edu/education/degrees-and-programs/doctor-of-philosophy/phd-in-biostatistics	PhD	BIOS 1: Carry out and explain calculations, derivations and proofs central to basic statistical theory, and explain their use and implications in applied statistical work. BIOS 2: Applied, theoretical and computational statistics. Applications in health care. Applications in biological settings & more BIOS 3: Carry out exploratory and descriptive analyses of complex data using standard statistical software and methods of data summary and visualization. BIOS 4: Carry out valid and efficient modeling, estimation, model checking and inference using standard statistical methods and software. BIOS 5: Demonstrate statistical programming proficiency, good coding style and use of reproducible research principles using leading statistical software BIOS 6: Demonstrate basic skills necessary for collaborating with non-biostatistical scientists, including mapping study aims to testable hypotheses, carrying out basic power and sample size estimation and evaluation, and identifying appropriate design, modeling and analysis methods to address study hypotheses. BIOS 7: Communicate, orally and in writing, simple and complex statistical ideas, methods and results in non-technical terms appropriate for collaborator needs (e.g. preparation of analysis section of grant proposals and methods and results sections of manuscripts) BIOS 8: Carry out and explain calculations, derivations and proofs central to advanced statistical theory, and explain their use and implications in applied statistical work. BIOS 9: Carry out advanced statistical modeling using a range of statistical theory, methods and computation. BIOS 10: Demonstrate advanced collaborative biostatistical skills, including formulating testable study aims, identifying, designing and evaluating statistical analyses appropriate for study aims, reading and synthesizing biostatistical literature relevant to study analyses, and suggesting new methods when existing approaches are inadequate. BIOS 11: Carry out independent biostatistical research involving development and evaluation of novel statistical methods and their application to problems of importance in health science research, and report the methods and findings orally and in writing (e.g. a dissertation and publishable papers).
Community & Behavioral Health https://coloradosph.cuanschutz.edu/education/degrees-and-programs/doctor-of-public-health/drph-in-community-behavioral-health	DrPH (track)	CBHS 1: Synthesize health behavior theories, models, frameworks and evidence-based integrative strategies at multiple levels of socio-ecological model to develop theory-informed conceptual models. CBHS 2: Apply advanced statistical methods used in social sciences, such as multilevel modeling or latent variable methods. CBHS 3: Collect and analyze qualitative data to inform a public health issue. CBHS 4: Design a research study that is responsive to community needs and answers a public health research question. CBHS 5: Demonstrate an in-depth knowledge in the candidate's chosen substantive interest area in behavioral/social science related to public health.

		CBHS 6: Develop a grant proposal to address a public health problem. CBHS 7: Integrate principles of design for dissemination into the development of a public health intervention.
Epidemiology https://coloradosph.cuanschutz.edu/education/degrees-and-programs/doctor-of-public-health/drph-in-epidemiology	DrPH (track)	EPID 1: Critically evaluate epidemiological study designs and describe the advantages and limitations of each for addressing specific problems, and recommend design modifications to strengthen validity. EPID 2: Apply basic ethical and legal principles involved in the collection, management, use and dissemination of epidemiologic data in research and public health practice. EPID 3: Select and apply appropriate research design and analysis methods when using secondary data sources, such as surveillance, national surveys, and medical record data, to answer epidemiologic questions. EPID 4: Demonstrate mastery of a substantive area in epidemiology, including the application of that knowledge in conducting research and implementing programs related to a specific epidemiologic question.EPID 5: Calculate and interpret measures of disease frequency and association to draw appropriate inferences and evaluate causality. EPID 6: Develop a grant proposal to address a public health problem.
Epidemiology https://coloradosph.cuanschutz.edu/education/degrees-and-programs/master-of-public-health/mph-in-epidemiology-at-cu-anschutz	MPH (track)	MPH-EPID 1: Compare and prioritize public health issues within and across populations, using epidemiologic methods including measures of prevalence, incidence, morbidity, mortality, demographic characteristics and risk factors. MPH-EPID 2: Critically review and evaluate public health and other scientific literature to identify threats to internal validity, strengths and weaknesses of individual studies, and assess for overall strength of evidence. MPH-EPID 3: Synthesize evidence in a research area to identify gaps in evidence and to demonstrate relevance of current knowledge to the practice of public health. MPH-EPID 4: Translate investigator ideas into answerable research questions. MPH-EPID 5: Design studies to address public health topics, taking into account the strengths, limitations, and feasibility of study designs for addressing specific topics, as well as the practical aspects of their uses. MPH-EPID 6: Describe best practices for design of data collection forms and protocols, instrument reliability and validity, data monitoring and quality assurance, and data archiving for analysis and use of data by other investigators. MPH-EPID 7: Use computer software for data entry, database management, and

		summarizing, analyzing and displaying data. MPH-EPID 8: Apply and interpret the concepts of effect modification, confounding, and bias in research design and analysis approaches.
Epidemiology https://coloradosph.cuanschutz.edu/education/degrees-and-programs/master-of-science/ms-in-epidemiology	MS	MS-EPID 1: Formulate sound scientific research questions. MS-EPID 2: Synthesize a body of evidence from the scientific literature and identify areas of need for future investigation. MS-EPID 3: Select and apply appropriate study design, data collection and analysis methods to address research or public health topics. MS-EPID 4: Utilize secondary data sources to answer a given research or public health question, considering limitations, study design and analytic solutions. MS-EPID 5: Critically appraise research and public health studies for internal and external validity, with consideration of how these issues influence interpretation of study findings. MS-EPID 6: Anticipate types of biases that may occur in research and public health studies and determine strategies to prevent or minimize these. MS-EPID 7: Calculate and interpret measures of disease frequency and association measures to draw appropriate inferences and evaluate causality. MS-EPID 8: Describe and apply basic ethical and legal principles involved in the collection, management, use and dissemination of epidemiologic data. MS-EPID 9: Communicate effectively, both orally and in writing, to non-statistical scientists or public health practitioners. MS-EPID 10: Interact effectively within a multidisciplinary team for the purpose of addressing a research question

| Epidemiology https://coloradosph.cuanschutz.edu/education/degrees-and-programs/doctor-of-philosophy/phd-in-epidemiology | PhD | PHD-EPID 1: Formulate sound scientific research questions and transform them into a research protocol and analysis plan. PHD-EPID 2: Critically review the scientific literature in order to appraise the methodologic quality of individual studies, qualitatively or quantitatively synthesize a body of evidence and identify areas of need for future investigation. PHD-EPID 3: Select and apply appropriate study design, data collection and analysis methods to address research or public health topics. PHD-EPID 4: Utilize a variety of data sources to address a given research or public health question; considering limitations, study design and analytic solutions. PHD-EPID 5: Interpret measures of disease burden associated with an exposure to determine the most impactful clinical or public health interventions. PHD-EPID 6: Critically appraise research and public health studies for internal and external validity, with consideration of how these issues influence interpretation of study findings. PHD-EPID 7: Anticipate types of biases that may occur in research and public health studies and determine strategies to prevent or minimize these. PHD-EPID 8: Calculate and interpret measures of disease frequency and association measures to draw appropriate inferences and evaluate causality. PHD-EPID 9: Develop statistical models appropriate to specific study designs, distinguishing between predictive, associative, and causality-based analytic approaches. PHD-EPID 10: Carry out appropriate power or precision calculations to ensure that sample size is sufficient to achieve the scientific aims or address a specific research hypothesis. PHD-EPID 11: Understand and apply nuanced ethical and legal principles involved in the collection, management, use and dissemination of epidemiologic data. PHD-EPID 12: Communicate both orally and in writing to make persuasive arguments for non-statistical scientists, practitioners and community members. PHD-EPID 13: Demonstrate expertise to lead a multidisciplinary research team or collaboration |

| Health Services Research

https://coloradosph.cuanschutz.edu/education/degrees-and-programs/master-of-science/ms-in-health-services-research | MS | MS-HSR 1: Identify the main components and issues of the organization, financing, and delivery of health services and public health systems in the U.S.
MS-HSR 2: Identify, and measure, clinically meaningful and/or policy relevant outcomes and apply evidence-based practice principles.
MS-HSR 3: Critically appraise existing literature and evaluate manuscripts published in peer-reviewed journals.
MS-HSR 4: Demonstrate breadth of health services research theoretical and conceptual knowledge by applying alternative organizational and behavioral models from a range of relevant disciplines.
MS-HSR 5: Pose innovative and important health services research questions, informed by systematic reviews of the literature, stakeholder needs, and relevant theoretical and conceptual models.
MS-HSR 6: Select the appropriate econometric/statistical specification and estimation technique, including using specification tests and theoretical justifications for distributional assumptions, the choice of link function, and estimation approach for a variety of outcomes.
MS-HSR 7: Choose and define the appropriate unit of analysis and approach to computing standard errors for conducting hypothesis test.
MS-HSR 8: Understand and apply methods for causal inference and identify the assumptions that may or may not hold for a causal interpretation.
MS-HSR 9: Write and know how to submit grant proposals to federal, state, and non-governmental organizations.
MS-HSR 10: Describe legal, ethical and regulatory issues related to clinical research.
MS-HSR 11: Demonstrate the ability to effectively communicate the findings and implications of health service research findings to technical and lay audiences.
MS-HSR 12: Design and conduct research studies using health services research methods and produce research suitable for publication in peer-reviewed journals.
MS-HSR 13: Discuss the policy process for improving the health status of populations. |

| Health Services Research

https://coloradosph.cuanschutz.edu/education/degrees-and-programs/doctor-of-philosophy/phd-in-health-services-research	PhD	PHD-HSR 1: Identify the main components and issues of the organization, financing and delivery of health services and public health systems in the U.S. PHD-HSR 2: Identify and measure clinically meaningful and/or policy relevant outcomes and apply evidence-based practice principles. PHD-HSR 3: Critically appraise existing literature and evaluate manuscripts published in peer-reviewed journals. PHD-HSR 4: Demonstrate a breadth of health services research theoretical and conceptual knowledge by applying alternative organizational and behavioral models from a range of relevant disciplines. PHD-HSR 5: Pose innovative and important health services research questions, informed by systematic reviews of the literature, stakeholder needs, and relevant theoretical and conceptual models. PHD-HSR 6: Select the appropriate econometric/statistical specification and estimation technique, including using specification tests and theoretical justifications for distributional assumptions, the choice of link function, and estimation approach for a variety of outcomes. PHD-HSR 7: Choose and define the appropriate unit of analysis and approach to computing standard errors for conducting a hypothesis test. PHD-HSR 8: Understand and apply methods for causal inference and identify the assumptions that may or may not hold for a causal interpretation. PHD-HSR 9: Write and know how to submit grant proposals to federal, state, and non-governmental organizations. PHD-HSR 10: Describe and adhere to legal, ethical and regulatory issues related to clinical research. PHD-HSR 11: Demonstrate the ability to effectively communicate the findings and implications of health service research through multiple modalities to an interdisciplinary audience. PHD-HSR 12: Independently design, conduct, and defend research studies using health services research methods. PHD-HSR 13: Participate in interdisciplinary collaboration, provide constructive reviews and feedback to colleagues, and demonstrate leadership in the appropriate application of health services research methods

| Health Systems, Policy & Management https://coloradosph.cuanschutz.edu/education/degrees-and-programs/master-of-public-health/mph-in-health-systems-management-policy | MPH (track) | *Health Systems & Health Economics* HSMP 1: Analyze the organization, financing and delivery of public and private health services in the U.S. and assess the effects of markets and political processes on these systems. HSMP 2: Apply commonly used methods for evaluating health economic policy, including the use of cost-benefit and cost-effectiveness analysis. HSMP 3: Evaluate differences between models used for financing and delivering health care across countries. *Managment & Leadership* HSMP 4: Explain key elements of human resource management: defining roles and responsibilities; recruiting, motivating and retaining staffing; and assessing and applying measures for performance improvement. HSMP 5: Apply common quality and performance improvement tools in public health and health care settings. HSMP 6: Apply principles of budgeting and financial decision analysis in public health and health care settings HSMP 7: Examine attributes of strategic leadership, including the use of vision, mission, values, goals and objectives. *Policy* HSMP 8: Differentiate key public health laws, regulations and policies affecting health programs and the delivery of health services. HSMP 9: Investigate commonly used frameworks for systematically and critically evaluating the policy development and implementation process at the federal, state, and local levels and outside the U.S. HSMP 10: Develop a plan for engaging stakeholders and building coalitions in the development or implementation of health policy. HSMP 11: Examine how ethical considerations (such as social justice and human rights) influence health policy. HSMP 12: Analyze how organization and delivery of health care in the U.S. relates to health equity. |

| Occupational & Environmental Health

https://coloradosph.cuanschutz.edu/education/degrees-and-programs/doctor-of-public-health/drph-in-environmental-occupational-health | DrPH (track) | EHOH 1: Critically evaluate toxicological and epidemiological data, and use it to inform and participate in risk-based decision making processes.
EHOH 2: Describe local, regional and global impact of environmental hazards on human and ecological health, and design appropriate studies to evaluate risks associated with these hazards.
EHOH 3: Evaluate contemporary environmental and occupational health issues using geographic, epidemiologic, or other data collection methods as appropriate.
EHOH 4: Create a data collection and management plan for an environmental or occupational health research study.
EHOH 5: Identify and critically evaluate secondary data sources appropriate for answering applied research and program evaluation questions in environmental and occupational health.
EHOH 6: Develop grant proposals to conduct research to test well-conceived hypotheses and/or evaluation studies to assess impact. |

| Public Health

https://coloradosph.cuanschutz.edu/education/degrees-and-programs/doctor-of-public-health | DrPH | *Data & Analysis*
DrPH 1: Explain qualitative, quantitative, mixed methods and policy analysis research and evaluation methods to address health issues at multiple (individual, group, organization, community and population) levels
DrPH 2: Communication -The ability to assess and use communication strategies across diverse audiences to inform and influence individual, organization, community, and policy decisions that enhance health.
DrPH 3: Explain the use and limitations of surveillance systems and national surveys in assessing, monitoring and evaluating policies and programs and to address a population's health

Leadership, Management & Governance
DrPH 4: Propose strategies for health improvement and elimination of health inequities by organizing stakeholders, including researchers, practitioners, community leaders and other partners
DrPH 5: Communicate public health science to diverse stakeholders, including individuals at all levels of health literacy, for purposes of influencing behavior and policies
DrPH 6: Integrate knowledge, approaches, methods, values and potential contributions from multiple professions and systems in addressing public health problems
DrPH 7: Create a strategic plan
DrPH 8: Facilitate shared decision making through negotiation and consensusbuilding methods
DrPH 9: Create organizational change strategies
DrPH 10: Propose strategies to promote inclusion and equity within public health programs, policies and systems
DrPH 11: Assess one's own strengths and weaknesses in leadership capacities, including cultural proficiency
DrPH 12: Propose human, fiscal and other resources to achieve a strategic goal
DrPH 13: Cultivate new resources and revenue streams to achieve a strategic goal

Policy & Programs
DrPH 14: Design a system-level intervention to address a public health issue
DrPH 15: Integrate knowledge of cultural values and practices in the design of public health policies and programs
DrPH 16: Integrate scientific information, legal and regulatory approaches, ethical frameworks and varied stakeholder interests in policy development and analysis
DrPH 17: Propose interprofessional team approaches to improving public health

Education & Workforce Development
DrPH 18: Assess an audience's knowledge and learning needs |

		DrPH 19: Deliver training or educational experiences that promote learning in academic, organizational or community settings DrPH 20: Use best practice modalities in pedagogical practices

| Public Health

https://coloradosph.cuanschutz.edu/education/degrees-and-programs/master-of-public-health | MPH | *Evidence-based Approaches to Public Health*
MPH 1: Apply epidemiological methods to the breadth of settings and situations in public health practice
MPH 2: Select quantitative and qualitative data collection methods appropriate for a given public health context
MPH 3: Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.
MPH 4: Interpret results of data analysis for public health research, policy or practice.
Public Health and Health Care Systems
MPH 5: Compare the organization, structure, and function of health care, public health and regulatory systems across national and international settings.
MPH 6: Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels.

Planning and Management to Promote Health
MPH 7: Assess population needs, assets and capacities that affect communities' health
MPH 8: Apply awareness of cultural values and practices to the design or implementation of public health policies or programs.
MPH 9: Design a population-based policy, program, project or intervention
MPH 10 Explain basic principles and tools of budget and resource management
MPH 11: Select methods to evaluate public health programs

Policy in Public Health
MPH 12: Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
MPH 13: Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
MPH 14: Advocate for political, social or economic policies and programs that will improve health in diverse populations
MPH 15: Evaluate policies for their impact on public health and health equity

Leadership
MPH 16: Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making
MPH 17: Apply negotiation and mediation skills to address organizational or community challenges
Communication
MPH 18: Select communication strategies for different audiences and sectors |

		MPH 19: Communicate audience-appropriate public health content, both in writing and through oral presentation
		MPH 20: Describe the importance of cultural competence in communicating public health content
		Interprofessional Practice
		MPH 21: Perform effectively on interprofessional teams Systems Thinking
		MPH 22: Apply systems thinking tools to a public health issue

Graduate School

Program	Degree	Outcomes
Biomedical Science and Biotechnology https://gs.ucdenver.edu/biotech/curriculum.php	MS	1. Apply principles of experimental design and problem solving in the biomedical sciences 2. Apply statistical tools for data composition, mining and analysis 3. Employ state of the art techniques in biomedical sciences 4. Design strategies for rational drug design 5. Conduct research in an ethical manner 6. Engage in critical analysis of the scientific literature 7. Apply the principles of project management 8. Understand and operate in the regulatory environment of life science innovation 9. Analyze the process of biomedical entrepreneurship in academic, government, and corporate settings 10. Write a well-supported, well-reasoned scientific or technical paper
Cancer Biology https://www.cuanschutz.edu/graduate-programs/cancer-biology/about	PhD	1. Demonstrate a basic knowledge of central concepts in the biomedical sciences. 2. Understand the current concepts in Cancer Biology. 3. Read and critically evaluate the scientific literature. 4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects. 5. Orally communicate ideas and research results effectively. 6. Effectively communicate ideas and research results in written form. 7. Integrate and apply the communication and research skills through oral presentations at scientific seminars, conferences, and other venues, submission of competitive applications for research funding, authorship of abstracts, peer-reviewed publications, and a thesis dissertation.
Cell Biology, Stem Cells and Development https://www.cuanschutz.edu/graduate-programs/cell-biology-stem-cells-and-development/about	PhD	1. Demonstrate a basic knowledge of central concepts in the biomedical sciences. 2. Understand the current concepts in Cell Biology, Stem Cell Biology and Development. 3. Read and critically evaluate the scientific literature. 4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects. 5. Present research results in peer-reviewed publications and in a dissertation. 6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues. 7. Write a competitive application for research funding. 8. Develop ancillary skills, where necessary, to obtain positions outside of scientific research.

Clinical Science https://cctsi.cuanschutz.edu/training/clsc#masters	MSCS	This program provides learning in new fields and acquisition of skills in clinical research to prepare clinicians for careers in clinical and translational sciences. Didactic course work and a mentored research project aimed to provide a strong foundation in: 1. Computational and statistical tools 2. Clinical epidemiology 3. Clinical research study design 4. Health services and outcomes research 5. Biomedical ethics
Clinical Science https://cctsi.cuanschutz.edu/training/clsc#phd	PhD	1. Perform human research adhering to legal, ethical and regulatory principles and and guidelines 2. Critically appraise existing literature and sources of information 3. Apply evidence based practice principals 4. Accurately select, use and interpret commonly used statistics 5. Apply and use appropriate study designs and methods to address research questions/hypotheses 6. Identify and measure clinically relevant and meaningful outcomes 7. Design and conduct research studies 8. Publish research-based manuscripts to peer-reviewed journals 9. Prepare and submit grant proposals 10. Provide constructive reviews and feedback to colleagues 11. Demonstrate effective communication and leadership skills 12. Participate in interdisciplinary collaboration
Computational Bioscience https://www.cuanschutz.edu/graduate-programs/computational-bioscience/about	PhD	Knowledge Goals - Graduates demonstrate their knowledge of core concepts and principles of computational bioscience, and the ability to apply computation to gain insight into significant biomedical problems. This knowledge includes mastery of the fundamentals of biomedicine, statistics and computer science, as well as proficiency in the integration of these fields. Graduates contribute to the discovery and dissemination of new knowledge. 1. Demonstrate knowledge of the scientific principles that underlie the current understanding of molecular biology, statistics and computer science. 2. Demonstrate an ability to productively integrate knowledge from disparate fields to solve problems in biomedicine using computational methods. 3. Demonstrate knowledge of the types and sources of data most commonly used in computational bioscience, including knowledge of all major public data repositories. 4. Demonstrate the knowledge of the classes of algorithms most often applied in computational bioscience, and their domains of applicability. 5. Demonstrate an understanding of the principles and practice of the scientific method as applied in computational bioscience, including experimental design, hypothesis testing, and evaluation of computational systems.

		Communication Skills Goals - Graduates demonstrate interpersonal, oral and written skills that enable them to interact productively with scientists from both biomedical and computational domains, to clearly communicate the results of their work in appropriate formats, and to teach others computational bioscience skills. Graduates are able to bridge the gap between biomedical and computational cultures. 1. Communicate effectively, both orally and in writing, in an appropriate range of scientific formats, including formal presentations, collaborative interactions, and the critique of others' work. 2. Demonstrate familiarity with both biomedical and computational modes of expression, and be able to communicate clearly across disciplinary boundaries. 3. Demonstrate commitment and skill in teaching to and learning from students, colleagues, and other members of the scientific community. Professional Behavior Goals - Graduates demonstrate the highest standards of professional integrity and exemplary behavior, as reflected by a commitment to the ethical conduct of research, continuous professional development, and thoughtfulness regarding the broader implications of their work. 1. Act in an ethically responsible manner, displaying integrity, honesty, and appropriate conduct at all times. 2. Recognize the limits of one's knowledge, skills, and behavior through self-reflection and seek to overcome those limits. 3. Always consider the broad significance of one's professional actions, including their implications for society and the living world. Self-Directed and Life Long Learning Goals - Graduates demonstrate habits and skills for self-directed and life-long learning, and recognize that computational bioscience is a rapidly evolving discipline. Our focus is on the development of adaptive, flexible and curious scientists able to comfortably assimilate new ideas and technologies during the course of their professional development. 1. Recognize the need to engage in lifelong learning to stay abreast of new technologies and scientific advances in multiple disciplines. 2. Locate, evaluate and assimilate relevant new knowledge and techniques from a wide variety of sources.
Genetic Counseling https://www.cuanschutz.edu/graduate-programs/genetic-counseling	MS	Domain I: Genetics Expertise and Analysis 1. Demonstrate and utilize a depth and breadth of understanding and knowledge of genetics and genomics core concepts and principles 2. Integrate knowledge of psychosocial aspects of conditions with a genetic component to promote client well-being. 3. Construct relevant, targeted and comprehensive personal and family histories and pedigrees. 4. Identify, assess, facilitate, and integrate genetic testing options in genetic counseling

practice.
5. Assess individuals' and their relatives' probability of conditions with a genetic component or carrier status based on their pedigree, test result(s), and other pertinent information.
6. Demonstrate the skills necessary to successfully manage a genetic counseling case.
7. Critically assess genetic/genomic, medical and social science literature and information.

Domain II: Interpersonal, Psychosocial and Counseling Skills
8. Establish a mutually agreed upon genetic counseling agenda with the client
9. Employ active listening and interviewing skills to identify, assess, and empathically respond to stated and emerging concerns
10. Use a range of genetic counseling skills and models to facilitate informed decision-making and adaptation to genetic risks or conditions.
11. Promote client-centered, informed, non-coercive and value-based decisionmaking
12. Understand how to adapt genetic counseling skills for varied service delivery models.
13. Apply genetic counseling skills in a culturally responsive and respectful manner to all clients.

Domain III: Education
14. Effectively educate clients about a wide range of genetics and genomics information based on their needs, their characteristics and the circumstances of the encounter.
15. Write concise and understandable clinical and scientific information for audiences of varying educational backgrounds.
16. Effectively give a presentation on genetics, genomics and genetic counseling issues.

Domain IV: Professional Development & Practice
17. Act in accordance with the ethical, legal and philosophical principles and values of the genetic counseling profession and the policies of one's institution or organization.
18. Demonstrate understanding of the research process
19. Advocate for individuals, families, communities and the genetic counseling profession.
20. Demonstrate a self-reflective, evidenced-based and current approach to genetic counseling practice.
21. Understand the methods, roles and responsibilities of the process of clinical supervision of trainees.
22. Establish and maintain professional interdisciplinary relationships in both team and one-on-one settings, and recognize one's role in the larger healthcare system

Human Medical Genetics and Genomics https://www.cuanschutz.edu/graduate-programs/human-medical-genetics-and-genomics/about	PhD	1. Demonstrate a basic knowledge of central concepts in the biomedical sciences. 2. Understand current concepts in human genetics and genomics. 3. Read and critically evaluate the scientific literature. 4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects. 5. Present research results in peer-reviewed publications and in a dissertation. 6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues. 7. Write a competitive application for research funding. 8. Develop ancillary skills, where necessary, to obtain positions outside of scientific research.
Immunology https://www.cuanschutz.edu/graduate-programs/immunology/curriculum	PhD	1. Demonstrate a basic knowledge of central concepts in the biomedical sciences. 2. Understand the current concepts in immunology. 3. Read and critically evaluate the scientific literature. 4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects. 5. Present research results in peer-reviewed publications and in a dissertation. 6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues. 7. Write a competitive application for research funding. 8. Develop ancillary skills, where necessary, to obtain positions outside of scientific research.
Integrated Physiology https://www.cuanschutz.edu/graduate-programs/integrated-physiology/about	PhD	1. Demonstrate a basic knowledge of central concepts in the biomedical sciences. 2. Understand the current concepts in Integrated Physiology. 3. Read and critically evaluate the scientific literature relevant to physiology, in specific, and the basic and clinical biomedical sciences, in general. 4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects. 5. Present research results in peer-reviewed publications and in a doctoral dissertation. 6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues. 7. Understand the basis of writing and submitting competitive applications for research funding. 8. Be competent in self-evaluation of acquired skills and understand how these skills may be perceived by external peers. 9. Develop a mature and meaningful Personal Development Plan (PDP) that will facilitate attainment of career objectives.

Microbiology https://www.cuanschutz.edu/graduate-programs/microbiology/about	PhD	1. Demonstrate a basic knowledge of central concepts in the biomedical sciences. 2. Understand current concepts in microbiology. 3. Read and critically evaluate the scientific literature. 4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects. 5. Present research results in peer-reviewed publications and in a dissertation. 6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues. 7. Write a competitive application for research funding. 8. Develop ancillary skills, where necessary, to obtain positions outside of academic research.
Modern Human Anatomy https://medschool.cuanschutz.edu/msmha/mha-course-list/learning-outcomes	MS	1. Demonstrate a broad knowledge of human anatomy a) Develop an in-depth and thorough understanding of human anatomy at the macroscopic level, including systems-based and regional anatomy. b) Develop an understanding of neural systems organization, cellular neurobiology, and topographic and vascular anatomy of the spinal cord, brain, and cerebrum. c) Develop a microscopic-level comprehension of human tissue, including the structure, function, and organization of cells and tissues. d) Evaluate and assess the developmental process of human embryonic and fetal periods, analyze congenital abnormalities, and integrate embryology to adult human gross anatomy. 2. Understand and apply multiple imaging and modeling modalities a) Synthesize image characteristics, informatics, acquisition, processing, and analysis with an emphasis on 3D and dynamic data. b) Create and implement 3D anatomical models. 3. Teach anatomical sciences at a professional level a) Develop content-based instructional and pedagogical skills, understand frameworks for making curricular decisions, implement active learning techniques and investigate the impact of teaching for diversity in health science programs. b) Apply pedagogical theories to practice in a professional program. 4. Complete a novel work or project that contributes to field of anatomical sciences a) Select a project or pursue an area of research that includes the investigation of one or more sub-disciplines in anatomical sciences, including areas such as: anatomical education, educational technology, clinical applications, and imaging and modeling. b) Demonstrate scientific literacy by critically evaluating your work in the context of published literature. c) Develop aims and establish a methodology for achieving the desired outcomes. d) Present the project publicly.

			e) Submit a final paper, outlining the project aims, methodology, and outcomes. 5. Develop an emphasis area within anatomy, anatomy education, and/or imaging and modeling
Molecular Biology https://www.cuanschutz.edu/graduate-programs/molecular-biology/about	PhD		1. Demonstrate a basic knowledge of central concepts in the biomedical sciences. 2. Understand the current concepts in Molecular Biology. 3. Read and critically evaluate the scientific literature. 4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects. 5. Present research results in peer-reviewed publications and in a dissertation. 6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues. 7. Understand the principles of scientific rigor, repeatability and reproducibility 8. Write a competitive application for research funding. 9. Develop ancillary skills, where necessary, to obtain positions outside of scientific research.
Neuroscience https://www.cuanschutz.edu/graduate-programs/neuroscience/curriculum	PhD		1. Demonstrate a basic knowledge of central concepts in the biomedical sciences 2. Understand the current concepts in Neuroscience 3. Read and Critically evaluate the scientific literature 4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects 5. Present research results in peer-reviewed publications and in a dissertation 6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues 7. Write a competitive application for research funding 8. Develop ancillary skills, where necessary, to obtain positions outside of scientific research

| Palliative Care

https://www.cuanschutz.edu/graduate-programs/palliative-care/curriculum | MS | 1. Communication Skills: The PC Community Specialist demonstrates expertise in relationship centered communication theory and skills to gather and share information, negotiate shared decision making and plans of care, and sustain relationships with palliative care patients/families and healthcare providers.
2. Expert Symptom Management Skills (Pain and Non-pain): The PC Community Specialist demonstrates expert clinical judgment in performing a comprehensive patient assessment, leading to diagnosis development, implementation, and ongoing reassessment with modification of effective, evidence-based care plans utilizing the skills and expertise of the interdisciplinary team (IDT), for all distressing pain and non-pain symptoms experienced by patients with any serious illness.
3. Ethics, Advocacy, and Legal Aspects of Care: The PC Community Specialist incorporates knowledge of ethical and legal aspects of palliative care into practice by exhibiting the highest professional standards and by advocating for the rights of patients/families to access optimal palliative care.
4. Spiritual, Religious and Existential Aspects of Care: As part of the IDT, the PC Community Specialist demonstrates and promotes spiritually sensitive care, respecting diversity in all forms, for patients/families and other health care professionals.
5. Social and Cultural Aspects of Care: As part of the IDT, the PC Community Specialist demonstrates respect for diverse communities through culturally sensitive skills, recognizing how social and economic barriers and challenges impact the delivery of health care services.
6. Psychological Aspects of Care: As part of the IDT, the PC Community Specialist effectively addresses psychological concerns, and promotes access to expanded resources for all patients/families living with any serious illness.
7. Integration of Palliative Care for patients throughout the course of any serious illness in all venues: The PC Community Specialist effectively advocates to provide evidence-based palliative care for patients/families and supports and develops expanded resources for all patients/families living with any serious illness.
8. Effective Palliative Care Educator: The PC Community Specialist demonstrates knowledge, skills, and applies adult learning principles when providing palliative care education to patients, families, healthcare professionals, and the community.
9. Systems Thinking: The PC Community Specialist demonstrates understanding of the healthcare system to effectively manage and utilize resources to support patients/families living with any serious illness and advocates for the reform of healthcare systems to provide optimal palliative care. |

Pharmacology https://www.cuanschutz.edu/graduate-programs/pharmacology/curriculum	PhD	1. Demonstrate a basic knowledge of central concepts of the biomedical sciences. 2. Understand the historical basis as well as current concepts in the scientific discipline of pharmacology. 3. Read and critically evaluate scientific literature relevant to pharmacology, in specific, and the basic and clinical biomedical sciences, in general. 4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects. 5. Writing: Present research results in peer-reviewed publications and in their doctoral dissertation. 6. Speaking: Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues. 7. Understand the basis of writing and submitting competitive applications for research funding. 8. Develop ancillary skills, where necessary, to obtain positions outside of scientific research. 9. Be competent in self-evaluation of acquired skills and understand how those skills may be perceived by external peers. 10. Develop a mature and meaningful Personal Development Plan (PDP) that will facilitate attainment of career objectives
Rehabilitation Science https://www.cuanschutz.edu/graduate-programs/rehabilitation-science/prospective-students	PhD	1. Critically analyze and integrate research findings from specialized disciplines to address complex problems of physical disablement. 2. Design and implement rigorous, innovative, and ethical research that will advance theoretical and/or applied principles of clinical practice in rehabilitation. 3. Disseminate findings of original research using standard scientific oral and written formats. 4. Compete for funding from national agencies to support interdisciplinary research and educational initiatives in rehabilitation. 5. Teach graduate level courses in a selected area of specialization within the field of rehabilitation. 6. Effectively communicate with clinicians, research scientists, and students in the field of rehabilitation and its affiliated disciplines using the common language of disablement. 7. Serve in leadership roles for professional activities that will advance the science and practice of rehabilitation medicine.

| Structural Biology & Biochemistry

https://www.cuanschutz.edu/graduate-programs/structural-biology-and-biochemistry/about | PhD | 1. Demonstrate a basic knowledge of central concepts in the biomedical sciences.
2. Understand the current concepts in structural biology and biochemistry.
3. Read and critically evaluate the scientific literature.
4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects.
5. Present research results in peer-reviewed publications and in a dissertation.
6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues.
7. Write a competitive application for research funding.
8. Develop ancillary skills, where necessary, to obtain positions outside of scientific research. |

School of Dental Medicine

Program	Degree	Outcomes
Dental Surgery https://dental.cuanschutz.edu/prospective-students/programs-of-study/doctor-of-dental-surgery/curriculum	DDS	Critical Thinking: 1. Evaluate and integrate emerging trends in health care 2. Utilize critical thinking to evaluate and integrate best research outcomes with clinical expertise and patient values for evidence-based practice. Professionalism: 3. Make professional decisions that satisfy legal, societal and ethical principles. 4. Use self-evaluative skills to assess individual knowledge and abilities, to practice within the scope of one's competence and make appropriate professional referrals, and to identify areas of deficiency to correct through lifelong learning. 5. Collaborate effectively with other health professionals to facilitate the provision of overall health care. Communication and Interpersonal Skills: 6. Apply appropriate interpersonal and communication skills to create a humanistic environment. 7. Communicate effectively with diverse patients and other health care providers to ensure appropriate, patient-centered patient treatment. Health Promotion: 8. Provide prevention, intervention and educational strategies. 9. Participate with dental team members and other health care professionals in the management and health promotion for all patients. 10. Recognize and appreciate the need to contribute to the improvement of oral health beyond those served in traditional practice settings. Practice Management and Informatics: 11. Evaluate and apply regulatory agency requirements for dental practices such as infection control, HIPAA and environmental and office safety programs 12. Apply principles of risk management including informed consent 13. Demonstrate effective business practices, financial management and human resource skills *Patient Care* Assessment, Diagnosis and Treatment Planning:

		14. Perform an examination that collects biological, psychological, clinical, radiographic and other diagnostic/consultative information required to evaluate the health, oral conditions, needs, and expectations of patients of all ages.
		15. Recognize, diagnose and interpret normal and abnormal conditions of the orofacial complex (to include oral cancer), occlusal and temporomandibular disease, craniofacial growth and development that require monitoring, treatment or management.
		16. Develop, present and discuss individual sequenced treatment plans for patients of all ages consistent with patient's condition, interest, goals and capabilities.
		Establishment and Maintenance of a Healthy Oral Environment
		Management of Emergency Situations:
		17. Anticipate, diagnose, and provide initial treatment and follow-up management for medical emergencies that may occur during dental treatment
		18. Recognize and manage dental emergencies to include acute pain, hemorrhage, trauma, and infection of the orofacial complex
		Control of Pain and Anxiety:
		19. Employ pharmacological agents and techniques to manage orofacial discomfort and psychological distress
		Periodontal Therapy:
		20. Diagnose, treatment plan, comprehensively treat, and maintain patients with periodontal disease in the primary, mixed, and permanent dentitions
		Endodontic Therapy:
		21. Diagnose and treat diseases of pulpal and periradicular origin in the primary, mixed, and permanent dentitions
		Surgical and Non-Surgical Therapies:
		22. Diagnose and treat conditions requiring reparative surgical procedures and non-surgical therapies on the hard and oral soft tissues
		Restorative/Prosthodontic Therapy:
		23. Provide single or multiple tooth restorations, with appropriate fixed or removable techniques, to restore anatomic form, function, and esthetics to patients of all ages.
		24. Continually analyze the outcomes of patient treatment to improve patient care.

| Dentistry (Orthodontics and Periodontics)

Orthodontics:
https://dental.cuanschutz.edu/prospective-students/programs-of-study/graduate-orthodontics/curriculum

Periodontics:
https://dental.cuanschutz.edu/prospective-students/programs-of-study/graduate-periodontics/curriculum | MS | Orthodontics:
Goal 1: Provide patient-based clinical care to help residents gain proficiency in orthodontics and deliver high-quality care to patients
Goal 2: Provide residents with broad-based didactics and a strong basis for continued learning and clinical practice
Goal 3: Provide residents the foundation to critically evaluate and conduct research
Goal 4: Encourage service and socially responsible behavior

Periodontics:
Goal 1: Provide comprehensive training that assures resident knowledge and proficiency in periodontics.Objective E: Demonstrate knowledge of pathogenesis/management of oral mucosal pathoses.
Goal 2: Provide instructional skills that will enable residents to effectively communicate/transmit knowledge of periodontics and related subjects.
Goal 3: Prepare residents for specialty board certification.
Goal 4: Create an atmosphere of scientific inquiry and scholarship.
Goal 5: Maintain rigorous evaluation of the residency program. |

School of Medicine

Program	Degree	Outcomes
Anesthesiology https://medschool.cuanschutz.edu/anesthesiology/education/anesthesiologist-assistant-program/program-information/student-learning-outcomes	MS	1. Evaluate patient medical history 2. Perform a physical examination 3. Understand the risks related to surgery 4. Formulate a safe and cost-effective anesthetic plan based on medical history, physical examination and type of surgery 5. Have the knowledge base to understand patient physiology and pathophysiology, pharmacology related to anesthesia 6. Have the knowledge base to appropriately respond to changes of patient condition during surgery 7. Use electronic medical record appropriately 8. Create a preoperative evaluation, intraoperative chart and a postoperative note in electronic medical record 9. Will be able to perform sedation, regional and general anesthesia safely and cost-effectively
Masters of Physician Assistant Studies 3 page PDF: https://medschool.cuanschutz.edu/docs/librariesprovider92/default-document-library/chapa-graduate-core-competencies.pdf?sfvrsn=91fe3fb9_2	MPAS	1. Patient Care: must be able to provide patient care that is compassionate, appropriate and effective for health promotion, disease prevention and the treatment of health problems. 2. Medical Knowledge: must demonstrate knowledge about established and evolving biomedical and clinical information (including epidemiological and social-behavioral sciences) and demonstrate the application of that knowledge to patient care. 3. Practice-Based Learning and Improvement: must be able to evaluate their practice in the context of current scientific evidence. Graduates must be able to access, critically evaluate and apply this evidence to improve patient care. 4. Interpersonal and Communication Skills: must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patients families, and professional colleagues from a variety of disciplines. 5. Professionalism: must demonstrate commitment to professional responsibilities, adherence to ethical principles, and sensitivity to diverse patient populations. 6. System-Based Practice: must demonstrate awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

| Medicine

https://www.ucdenver.edu/academics/colleges/medicalschool/education/degree_programs/MDProgram/Pages/Program-Competencies.aspx | MD | 1. Medical Knowledge for Practice: Demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of the knowledge to patient care.
2. Patient Care: Provide patient-centered care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health and wellness.
3. Practice-Based Learning and Improvement: Demonstrate the ability to investigate and evaluate one's care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.
4. Interpersonal and Communication Skills: Demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.
5. Professionalism: Demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.
6. Systems-Based Practice: Demonstrated an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.
7. Interprofessional Collaboration: Demonstrate the ability to engage in an interprofessional team in a manner that optimizes safe, effective patient - and population-centered care.
8. Personal and professional Development: Demonstrate the qualities required to sustain lifelong personal and professional growth. |
| Physical Therapy

https://medschool.cuanschutz.edu/physical-therapy-program/education-programs/doctor-of-physical-therapy/about-our-program/outcomes-demographics | DPT | 1. Patient-Centered Care
2. Clinical Reasoning and Evidence Based Practice
3. Movement for Participation
4. Teamwork and Collaboration
5. Quality Improvement and Safety

Specifically, the learning outcomes are that all (100%) of program graduates and their employers will be competent in:
a) Delivery of patient-centered clinical care.
b) Clinical reasoning and decision-making.
c) Applying foundational science knowledge to clinical care to promote patient/population movement for life participation.
d) Applying principles of teamwork and collaboration within healthcare systems.
e) Providing quality patient-centered health care that is safe, effective, ethical, equitable, and takes cost into account. |

Skaggs School of Pharmacy and Pharmaceutical Sciences

Program	Degree	Outcomes
Clinical Pharmacy https://pharmacy.cuanschutz.edu/academics/online-programs/ms-in-clinical-pharmacy#abos	MS	1. Collect appropriate patient data to make an assessment a) Identify and collect information from health records that will influence optimal pharmacotherapy b) Obtain a history from patient or caretaker (e.g. chief complain, medical medication management, financial, social cultural, review of systems) c) Conduct appropriate physical assessment relevant to pharmacy practice 2. Conduct a patient-centered assessment a) Recognize common symptoms/complaints b) Identify drug-related problems c) Determine disease severity, chronic disease control and therapeutic goals d) Prioritize identified problems in collaboration with the patient and other health care providers 3. Design, implement, evaluate and adjust a patient-centered pharmacy care plan a) Critically evaluate treatment options using sound scientific principles (including basic and clinical sciences) and evidence b) Consider patient specific characteristics, including health literacy, cultural diversity, and behavior psychosocial issues c) Select appropriate drug therapy (e.g. drug, dose, route frequency) d) Select appropriate non-drug therapy e) Develop a monitoring plan f) Conduct patient education including verification of patient understanding of treatment plan g) Implement interventions to improve adherence h) Refer to other providers as appropriate 4. Process medication related orders a) Perform calculations required to compound, dispense and administer medications b) Dispense medications in a manner that promotes safe, accurate and effective use

c) Prepare and compound extemporaneous preparations
d) Carry out duties in accordance with legal, ethical, social, economic and professional guidelines
5. Participate in population-centered care
a) Analyze epidemiologic, pharmacoeconomic, and pharmacogenomics data, medication use review, and risk management strategies
b) Apply, or participate in the development or implementation of population-specific, evidence-based disease management programs and protocols
6. Manage aspects of pharmacy operations using appropriate data and procedures
a) Comply with laws and regulations
b) Apply ethical and professional principles
c) Assess and improve medication distribution and control systems
d) Employ effective personnel management principles
e) Use sound principles of fiscal resource management
7. Participate in the management of a successful patient-centered practice
a) Describe a plan for the establishment, marketing and compensation for medication therapy management and patient care services
b) Use sound principles that support efficient and cost-effective utilization of resources (e.g. human, physical, medical, informational and technological)
8. Retrieve, evaluate and utilize basic science, professional and lay information in a critical and scientific manner that enhances the practice of pharmacy
a) Identify and select appropriate drug information resources
b) Demonstrate expertise in informatics by acquiring, storing, analyzing, using, and disseminating medication-related data and knowledge in a manner that optimize patient care and health outcomes
c) Evaluate the safety, efficacy, and pharmacoeconomic implications of medications, medical devices and patient care services
9. Manage medication use systems to optimize patient and population outcomes
a) Predict, identify, evaluate and report adverse drug reactions and medication errors and recommend actions to minimize drug misadventure
b) Participate in the process of conducting medication use evaluations
c) Describe, evaluate and navigate a health system's formulary process
d) Compile and evaluate literature necessary to review a class of

		medications and make formulary recommendations that influence pharmacy benefits
		e) Participate in the development of policies related to medication use and health systems
		10. Develop and participate in health promotion disease preventions and public health policy
		a) Participate in immunization provision programs
		b) Engage in public education programs (e.g. health fairs, screenings, brown bags, disease prevention)
		c) Collaborate with other organizations (e.g. governmental organizations, health organizations, business groups) to develop and promote public health policy
		11. Exhibit the highest standards of professional and ethical behavior in pharmacy practice (e.g. honesty, integrity, tolerance, confidentiality, care and compassion, respect for others, responsibility)
		a) Develop and maintain professional relationships with patients
		b) Develop and maintain professional relationships with other health care providers
		c) Make and defend rational, ethical decisions within the content of professional and personal values
		d) Respect and protect patient privacy
		12. Maintain professional competency and professional stewardship
		a) Identify and analyze emerging issues (including basic and clinical scientific advances), products, and services to improve pharmacy practice and public health
		b) Self-assess learning needs and design, implement and evaluate strategies to promote intellectual growth and continued professional competence
		c) Advance oneself and the profession through leadership, service activities and participation in professional organizations
		13. Apply basic and clinical scientific principles and methods to identify and solve problems
		a) Formulate a relevant and significant question or hypothesis
		b) Develop a strategy or method to answer the question or hypothesis
		c) Analyze available information to answer the question or reformulate hypothesis
		d) Provide evidence-based solutions that most effectively answers the question or hypothesis.
		e) As part of the Master's Thesis requirement, achieve all of the above outcomes at an advanced level through an application- and evidence-

		based research or program evaluation project designed to enhance clinical pharmacy practice by building on a combination of the student's awareness of a current, relevant practice issue or problem, and their learning in the program. 14. Communicate effectively using multiple strategies to improve health outcomes a) Communicate and collaborate with patients, caregivers and health care professional to engender an intraprofessional and interprofessional approach to patient-centered and population-centered care. b) Provide accurate and succinct verbal or written information that is appropriate for the target audience (e.g. patient, caregiver or other health care professional) c) Identify factors (e.g. low health literacy, cultural) that influence effective communication and modify communication strategies to optimize health care interactions. d) Display verbal and non-verbal mannerisms that promote empathetic, respectful and compassionate communication e) Appropriately document patient-specific information in health records f) Explain health-system related issues (e.g. pharmacy benefits, formularies) to relevant stake-holders (e.g. patients, caregivers, and healthcare providers)
Pharmaceutical Outcomes Research https://pharmacy.cuanschutz.edu/academics/phd-programs/pharmaceutical-outcomes-research	PhD	1. Demonstrate an in-depth knowledge of central concepts in Pharmaceutical Outcomes Research, including the areas of pharmacoeconomics, pharmacoepidemiology, and/or drug policy. 2. Critically appraise existing literature and sources of information. 3. Formulate hypotheses based on current concepts in the field and accurately and correctly design, conduct, and interpret their own research projects. 4. Present research results in peer-reviewed publications and in a dissertation.

		5. Perform research that adheres to the principles and guidelines of ethical conduct. 6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues
Pharmaceutical Sciences https://pharmacy.cuanschutz.edu/academics/masters-programs/pharmaceutical-sciences	MS	1. Demonstrate knowledge of core concepts in basic and clinical pharmaceutical sciences. 2. Critically evaluate the scientific literature. 3. Demonstrate proficiency in subject matter related to thesis research. 4. Demonstrate proficiency in assimilating and interpreting assigned subject matter. 5. Develop basic skills in the responsible conduct of research. a) Formulate hypotheses based on current concepts. b) Design and conduct research projects. c) Critically analyze findings in the context of existing literature. 6. Communicate research results effectively through oral presentations and written reports and publications. 7. Present research results at regional or national meetings and in peer-reviewed publications or thesis. 8. Establish a professional plan for a career in science.
Pharmaceutical Sciences https://pharmacy.cuanschutz.edu/academics/phd-programs/pharmaceutical-sciences#mission	PhD	1. Demonstrate a basic knowledge of central concepts in the biomedical sciences. 2. Understand the current concepts in basic and clinical pharmaceutical sciences. 3. Read and critically evaluate the scientific literature. 4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects. 5. Present research results in peer-reviewed publications and in a dissertation. 6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues.

| Pharmacy https://pharmacy.cuanschutz.edu/academics/pharmd/curriculum#abos | PharmD | 1. Collect appropriate patient data to make an assessment. 2. Conduct a patient-centered assessment 3. Design, implement, evaluate and adjust a patient-centered pharmacy care plan 4. Process medication related orders 5. Provide population-centered care. 6. Manage aspects of pharmacy operations using appropriate data and procedures. 7. Manage a successful patient-centered practice. 8. REtrieve, evaluate and utilize basic science, professional and lay information in a critical and scientific manner that enhances the practice of pharmacy. 9. Manage medication use systems to optimize patient and population outcomes. 10. Develop and participate in health promotion, disease preventions and public health policy. 11. Exhibit the highest standards of professional and ethical behavior in pharmacy practice (e.g. honesty, integrity, tolerance, confidentiality, care and compassions, respect for others, responsibility). 12. Maintain professional competency and professional stewardship. 13. Apply basic and clinical scientific principles and methods to identify and solves problems. 14. Communicate effectively using multiple strategies to improve health outcomes. |
| Toxicology https://pharmacy.cuanschutz.edu/academics/phd-programs/toxicology | PhD | 1. Demonstrate a basic knowledge of central concepts in the biomedical sciences. 2. Understand the current concepts in toxicology. 3. Read and critically evaluate the scientific literature. 4. Generate hypotheses based on current concepts in the field, then design, conduct, and interpret their own research projects. 5. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues. 6. Present research results in national meetings, peer-reviewed publications and in a dissertation. 7. Write a grant proposal. |