# Guide for Evaluating New Plan & Plan Change Forms

**Aligns with the AY 2017-18 Academic Catalog Forms**

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| Purpose of the Guide |

This guide was developed for faculty to use as they review New Plan and Plan Change Proposal Forms. Each section contains the original question posed on the New Plan or Plan Change Form, the rationale for reviewing the section, and examples of excellent responses. The purpose of the guide is to make it easier for faculty to review proposals and provide feedback for proposal submissions.

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| Justification: Question 4 of Plan Form |

***Review Form Question Prompt***

### 4a. Identify each of the following reasons provided in the proposer’s justification for adding or changing the academic program:

Improvements to the academic program (aligning curriculum to new or current learning outcomes, improving degree program progression, aligning learning experiences in pre-requisites),

Requirements or recommendations set forth by the program’s Academic Program Review or Specialized

Accreditation (addressing improvements based on input from external reviewers, industry trends, new or changing governmental regulations or external accreditation requirements),

Academic unit goals identified in a unit’s Annual Curriculum & Assessment Reports,

Evidence and assessment findings (assessments of student learning, needs assessments, student or employer surveys, comparisons to other programs in the field), and/or

Other important aspects of the academic unit and student learning not identified above.

### 4b. Does the justification adequately explain the reasons for a new plan or for making a plan change?

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

Identifying the type of justification used in the proposal assists the reviewer to determine whether the author included an adequate justification. In particular, the reviewer is seeking to understand how the proposal is meant to improve or otherwise enhance academic programs.

An “adequate” explanation establishes the purpose of the requested changes. Leaders are responsible for documenting improvements made to curriculum within their Discipline-Specific Accreditation and Academic Program Review (7-year review) Self-Study Report. With 3- to 6-year cycles of leadership for academic unit chairs and directors, it is necessary for the justification to be described clearly enough for incoming academic unit leaders to understand the reasons behind curriculum changes. Clarity in describing the reason for the justification will assist current and potentially future leaders to explain the reasoning behind curricular changes and determine whether changes result in improvements.

The reader should be able to understand an “adequate” explanation without having the author present to describe the justification. If the statement confuses a reviewer, then its likely that the justification is lacking crucial details as to the reasons for creating changes.

When Course Changes are submitted with a Plan Change, the Course Change and Plan Change justifications tend to be the same.

*Excellent Examples of New Plan Justifications:*

*Informatics B.S.*

Informatics centers on the intersection of computational and data sciences with engineering, the natural and social sciences, the arts, and business. The analysis of large-scale data sets and associated software development expertise in this area are continuing to be central in modern interdisciplinary scholarship and practice. The formation of the School of Informatics, Computing, and Cyber Systems (SICCS) in the College of Engineering, Forestry, and Natural Sciences (CEFNS) and NAU’s investments in building research capacity within this unit provide an important opportunity to broaden the impact of these investments to undergraduate students. We propose enabling the university to take advantage of this opportunity by developing a new Bachelor of Science in Informatics (BSI) program. The design of the BSI is driven by the following key goals:

* Leverage NAU’s strengths in interdisciplinary research to provide educational opportunities for students that support professional as well as graduate study goals;
* Support improvements in multiple metrics associated with university strategic goals;
* Develop curricular structures that support interdisciplinary learning and foster the development of research capacity across departmental boundaries;
* Efficiently leverage existing resources and course offerings, thus enabling the success of this new degree program during a time of constrained resources; and
* Appeal to high-achieving students and support NAU’s recruitment efforts in building an academically-strong student body.

*Nutrition & Foods B.S.*

This proposal aligns directly with many NAU goals and strategies:

1. Student Success: This UG Nutrition program and its innovative curricular design will directly address identified NAU strategies (a – f) for the goal of student success.
2. Nationally recognized research excellence: Nutrition and lifestyle related research opportunities are highly popular and numerous funding opportunities exist. Through recruitment of high quality faculty with skill and research capacity in nutrition, NAU will expand its ability to respond to large collaborative projects. Many potential collaborations on NAU campus and within Arizona already exist.
3. Global Engagement: Faculty and students in this new program will immediately be able to participate in ongoing and future global initiatives (i.e. MHIRT). Clearly, nutrition and lifestyle related diseases are a global challenge.
4. Diversity, Civic Engagement, and Community Building: The curriculum proposed includes a comprehensive community-based experience that promotes community engagement (e), engages students to understand the complexities of the human experience (b).
5. Commitment to Native Americans: Considering our geographic location, this program has great potential to influence and inform existing and future outreach programs for Native American communities. Based on student feedback, this new undergraduate major will also be popular among Native American students.
6. Sustainability and Effectiveness: Sustainable food systems and production will be an important part of the curriculum and related research agendas.

Nutrition plays a vital part in overall health and wellness, disease prevention, and management and treatment of existing disease. This is directly aligned with the educational mission of the College of Health and Human Services (CHHS). Additionally, and perhaps more importantly, many CHHS programs and programs outside the college (e.g. Exercise Sciences and Hotel Restaurant Management) have curricular needs for nutritional content that are not being met. It is unfortunate that several programs in health sciences include an “any nutrition” course requirement to meet program needs in the absence of existing nutritional programming at NAU. At this time, only one nutrition course is offered at NAU (NTS 256 – Medical Nutrition). Enrollment is significant in this course (e.g. Fall 2015 had 4 sections with total enrollment of 383) suggesting potential demand for nutrition programming. Two NAU department chair’s outside Health Sciences (Biology and HRM) have confirmed that such a program would positively benefit their programs as well. Other yet uncovered synergies are likely to exist among several existing undergraduate and graduate programs at NAU that include introductory nutrition content within their own prefixes. They do this because the content expertise does not exist elsewhere (e.g. Physical Therapy, Athletic Training, Dental Hygiene, Nursing,…).

*Excellent Examples of Plan Change Justifications:*

*Nursing DNP*

*Notice how the program discusses the learning elements related to the plan change request.*

The changes to the DNP Plan include addition of required course NUR 609: SYNTHESIS OF WRITING, RESEARCH AND STATISTICAL PRINCIPLES IN HEALTHCARE and deletion of the program prerequisite of a graduate level statistics course. This change was made to ensure that all DNP students have a graduate level proficiency to critically analyze professional literature and communicate that analysis through scholarly writing based on knowledge about research design, methodology, implementation, and statistical analysis. Even though inferential statistics has been a prerequisite class for DNP students, it does not appear to prepare them to critically analyze the use and application of statistics to clinical evidence and ultimately, to their clinical practice projects. Through feedback communicated by ongoing DNP students, graduates, and faculty, we have discovered a wide range in the level of preparation and expertise within our newly admitted students. Consequently, individual faculty have been incorporating these foundational skills within the DNP courses often compromising content more relevant to those courses’ descriptions and outcomes. This newly required DNP course will significantly impact the overall level of academic rigor and success of students toward the degree.

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| Academic Program Purpose Statement: Question 5 of Plan Form |

## Introduction to the Academic Program Purpose Statement:

The purpose statement identifies the overall goals or aims of the degree program, as collectively understood by the faculty members teaching in the degree program. The degree program purpose statement summarizes the following in a manner that differentiates it from other academic programs offered at NAU:

* The scope of the program,
* The content studied, skills developed, and/or the learning experiences provided, and
* The future opportunities for which it prepares students.
* Programs with emphases also summarize the content and skills unique to each emphasis area.
* Graduate degree programs also address the population that is best suited for the graduate program.

*Rationale*

Understanding and articulating a program’s overall goals or aims accomplishes a number of things. Most importantly, it clarifies for students who may know little about the discipline or program the boundaries of the discipline, as studied by the academic unit, summarizes what and how students will learn within the degree, and expresses the future opportunities students will be prepared to achieve. It requires the program’s faculty to come to agreement upon the purpose of learning, the boundaries of learning, and the future opportunities students will be prepared to engage in upon completion of the program.

The clear identification of the overall goals and aims of the program assists faculty in determining the program and course level learning outcomes that will lead to the achievement of the program’s purpose. Finally, the purpose is meant to guide and focus faculty instructional decisions as they design the curriculum to achieve the program’s larger aims and goals.

***Review Form Question Prompt***

### 5a. Does the academic program’s purpose statement adequately summarize the scope of the program.

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

“Scope” indicates the breadth of the field covered by the academic program. It identifies the aspects of the discipline, field, or area of knowledge addressed by the academic program. The primary goal of the “scope” is to define the boundaries of the program. Some of our programs are similar, and the scope differentiates a program’s boundaries so that students can review two degrees and make an informed choice about which degree to pursue.

*Examples*

An excellent example is provided by the Forensics Minor (below). What makes this particular purpose statement excellent is that it:

* Opens by clarifying what students study in the field of “Forensic Science.”
* The second sentence clarifies the area of Forensic Science addressed within the “Social Sciences Forensic Minor” program, clearly describing the sub-set of knowledge covered by the minor.
* The third sentence expounds upon the issues specifically addressed by the minor.

*(1) “Forensic science” is the application of a wide spectrum of sciences and techniques that aid in detecting and solving crime, identifying individuals (victims and offenders) involved in crime, reconstructing events before, during and after the crime, and service to the courts and legal system. (2) In the Social Sciences Forensic Minor, students develop an understanding of the social, cultural, historical and political differences in the United States and globally, impacting forensic science development and its application in theory and method in criminology, criminal justice and law enforcement systems. (3) These include issues of gender, ethnicity, social inequality, and changing cultural dynamics and values affixed to human life, civil rights and criminal justice.*

The Chemistry M.S. degree’s scope clearly identifies that the student will focus their time energy on the development of experimental approaches in a specific field:

*The Chemistry M.S. program prepares students for research-focused professions in the chemical sciences, emphasizing the development of a students' ability to develop experimental approaches that accurately capture information to solve questions and problems in their chemical field of study.*

For academic programs having a great deal of breadth in their program, the “scope” can be addressed by the “content studied, skills developed, and learning experiences” of the degree. Here is an example from the English B.A. (The bolded section is what we would identify as addressing both the “scope” and the “content studied, skills developed, and/or the learning experience(s) provided.”)

*The Bachelor of Arts in English prepares graduates for any future that demands proficiency in literature, language, and writing, as well as general excellence in resourceful, well-informed communication.* ***Our graduates recognize the close weave of logical thought and effective expression, strive for more persuasive or more creative uses of English, possess the sense and insight to appreciate the value and quality of literature, have developed their historical and cultural imaginations by studying the marks of other times and diverse peoples in language and text, and recognize the global contexts of English as well as the social, civic, and environmental responsibilities that come with a liberal education.*** *Our graduates have attained the high-level literacy skills and have practiced the research methods needed to compete in graduate and professional schools and to succeed in the workplace. With our help, they have prepared themselves to become productive, responsible members of the communities in which they live and work.*

***Review Form Question Prompt***

### 5b. Does the academic program’s purpose statement adequately summarize the content studied, the skills developed, and/or the learning experiences provided.

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

The phrase “the content studied, skills developed, and/or learning experience(s) provided” ensures the purpose statement includes a summary of the essential learning outcomes and associated learning experiences that comprise the program.

*Examples*

The following unit successfully separated their program’s scope from their discussion of content, skills, and learning experiences:

*Event Management Certificate:*

(Scope) The Event Management Certificate prepares students for careers in event-planning departments of hotels, convention facilities, exhibition facilities, country clubs, and resorts. Students gain background and experiences in planning, budgeting, and implementing conferences, meetings, and other special events in the public and private sectors.

(Content, Skills, Learning Experiences) Coursework provides students with professional preparation focusing on the concepts and principles involved in catering events; meetings, events, and convention management; interior design for event spaces; special events management; budgets and finance; site selection; contracts, vendors, and negotiations; marketing and promotions; food production; and meeting technology.

At the completion of the certificate, students will be able to demonstrate event-planning skills via an on-site, hands-on internship; interpret and evaluate effective space planning solutions for a variety of event venues; formulate and manage an event budget; and explain the process of planning, selecting, and scheduling activities, organizing volunteers and staff, and marketing and promoting a variety of events.

*Environmental Sciences & Policy MS:*

(Scope) Lasting solutions to most environmental problems are likely to be found at the nexus of the natural and social sciences. The Master of Science in Environmental Sciences and Policy (MS ES&P) is an interdisciplinary degree program that combines a series of science and policy core courses with a breadth of specialized classes from across the University.

(Content, Skills, Learning Experiences) The MS ES&P program provides applied, cross-disciplinary training to prepare students to solve environmental problems using the scientific method combined with an in-depth knowledge of the political system. Students gain this knowledge through their individual thesis research and coursework in quantitative research methods, natural sciences and political sciences. The MS ES&P program's rigorous training in the natural and political sciences prepares graduates for successful environmental careers in industry, government, and the non-profit sector. Our graduates can successfully communicate across multiple disciplines and negotiate scientifically and politically sound solutions to the wide range of environmental problems that currently challenge our society. The ES&P curriculum trains students how to assess the costs and benefits of various public policies and actions. The research skills gained by ES&P students help them continue to expand their knowledge long after they graduate from the program. This training and experience helps our graduates assume leadership roles in environmental fields. Finally, the MS ES&P program prepares students for entry into Ph.D. programs in environmental sciences and other related fields if they choose to continue in an academic track.

***Review Form Question Prompt***

### 5c.Does the academic program’s purpose statement adequately summarize the future opportunities for which it prepares students.

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

In order to incorporate concepts of “Backward Design” (designing a program’s curriculum by first setting the goals of the program, then working backward to develop approaches to instruction and course progression that will achieve those goals), we encourage faculty to identify the future opportunities students will succeed in upon completion of the program. In addition, students, parents and other external audiences are curious about how specific fields and areas assist them toward their future goals.

*Examples*

Descriptions taken from purpose statements that exemplify this characteristic are as follows:

*Human Resources Management Certificate*

“At the completion of the certificate, students will be able to demonstrate accurate knowledge of human resources practices, scientific findings from industrial-organizational psychology, the ability to work as part of a successful team, and should be well prepared to either pass the exam to receive the APHR certificate and create an entryway into a successful career in human resources or to be successful in graduate studies in industrial/organizational psychology.”

*English B.A.*

“Our graduates have attained the high-level literacy skills and have practiced the research methods needed to compete in graduate and professional schools and to succeed in the workplace. With our help, they have prepared themselves to become productive, responsible members of the communities in which they live and work.”

*Electrical Engineering: B.S.E.*

…Our rigorous curriculum will help you pursue a career designing and developing the latest smart phone, renewable energy system, and all the electronic chips, equipment and products in between that benefit people by connecting, healing, informing, entertaining, defending, and providing the essentials for life.

*Sociology B.S.*

The Bachelor of Science in Sociology program provides students with the knowledge, skills, and abilities to enter the world of social and government services, business, industry, and organizations. The sociological perspective is essential for succeeding in today’s multiethnic and multinational work force. Our sociology major stresses an awareness of social factors such as race, ethnicity, gender, age, education, and social class that both influence and are affected by social structures. This perspective is an excellent preparation for a wide variety of occupations… Students will leave this program with an ability to make sense of the shifting social world and contribute solutions to difficult social problems... Sociology graduates are critically informed, value diversity and equality, and use their knowledge of sociology to pursue careers that promote these ideals.

*Health Sciences Allied Health B.S.:*

These programs are specifically designed for students who have completed their associate’s degree in an allied health discipline from a regionally-accredited program and who have successfully obtained the related professional license… We specialize in preparing students in enhancing their careers with an understanding of the importance of leadership and inter-professional teamwork among health professionals, as well as skills to sustain personal health and well-being.

*Communication M.A.*

The MA in Communication (with no emphasis) will be of relevance to working professionals in a variety of fields, educators, activists, and those preparing to pursue a PhD in Communication, Communication Studies, Rhetoric, or related disciplines.

***Review Form Question Prompt***

### 5d. Only for Programs with Emphases: Programs with emphases summarize the content and skills unique to each emphasis area.

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

Since the Purpose Statement is meant to summarize the scope, content, skills, and/or learning experiences of the degree, if there are emphasis areas, it makes sense to include a brief summary of those emphasis areas in the Purpose Statement.

*Examples*

*Environmental Sciences & Policy MS: Two Emphasis Areas*

This two-year degree program has two distinct emphasis areas: Environmental Sciences and Policy, and Paleoenvironmental Sciences. The core courses for both emphases include: 1) The Environmental Science-Policy Interface (ENV 555), 2) two research methods seminars (ESS 505, 506), 3) one or more quantitative analysis courses, and 4) thesis credits. All ES&P students work closely with a faculty adviser to design and implement individual thesis research. Students in the Environmental Sciences and Policy emphasis generally focus their coursework and research on the science-policy interface and may examine a wide range of environmental problems such as issues related to food security, pollution, or resource management. Students in Paleoenvironmental Sciences emphasis generally analyze ancient environments to gain insights to help predict future environmental dynamics, particularly related to climate change.

*Biology, MS: One Emphasis Area*

Students pursuing the emphasis in Ecology, Evolution & Conservation Biology will integrate theoretical and empirical concepts in ecology and evolutionary biology to understand ecological patterns and the mediating processes that drive populations, communities and ecosystems.  Students will become familiar with ecological sampling techniques and statistical methodologies necessary to characterize populations, communities and ecosystems over broad geographic regions, and will apply current approaches for identifying and mitigating the effects of invasive species and anthropogenic impacts on threatened and endangered species within the natural ecosystems they inhabit.

***Review Form Question Prompt***

### 5e. For graduate degrees only: The degree program’s purpose statement identifies student populations who would benefit most from the degree.

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

Students tend to enroll in graduate degrees to enhance their career progression and future professional goals. In addition, most graduate degrees have specific admissions criterion requiring previous enrollment or experience with various courses or programs. Based on these attributes, it makes sense to identify the student populations who would benefit most from the degree, so that students can easily identify whether they have the qualifications for a program, and whether the program will prepare them for the future goals toward which they aim.

*Examples*

Here is a good example of two programs that appear similar from their names, but which the faculty designed for different populations:

*Science Teaching M.S.*

MAT is a challenging Master's program that prepares science teachers for teaching in grades 7-12 and emphasizes the development of a teacher’s ability to develop research-based teaching strategies that make science accessible to learners. Specific attention is directed at the interaction of schools, learners, pedagogy, subject matter and curriculum. The program is unique in that it focuses solely on science education. This allows you to be in a supportive cohort of high-achieving science peers taught by faculty who specialize and conduct research in science education. We strive to provide a cutting-edge, high-quality program that will utilize and build upon your science knowledge and experiences to become an innovative middle or high school teacher. The program is designed for students with strong undergraduate preparation in the sciences seeking certification to teach biology, chemistry, physics, earth science, or general sciences at the secondary (middle and high school) level.

*Master of Arts in Teaching Science*

The MA degree is designed to meet your needs as a professional science educator.  The program can be taken on the Flagstaff campus or synchronous online through video conferencing. Whether you want to increase your knowledge of pedagogy or science content in order to improve your practice or you are interested in becoming a leader in your school or district, we are here to help you.

The MAST degree is designed for:

* Licensed secondary (middle or high school) science teachers pursuing advanced knowledge in the profession.
* Secondary science teachers preparing for leadership roles such as secondary curriculum, instruction or professional development specialists, department heads, etc.
* International science educators interested in extending their knowledge and skills through engaging in the American school system.

While many MA students continue to work during the program, it is possible to complete the program as a full-time, on-campus student. This allows you to take a greater variety of science content courses and provides the opportunity to engage with faculty on science education research projects. Competitive graduate assistantships are available to mitigate tuition costs and provide a monthly stipend (see the funding section below). We would highly recommend this option for incoming international students.

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| Academic Program Purpose Statement: Question 6 of Plan Form |

## Introduction to Degree Program Student Learning Outcomes

Degree program student learning outcomes define the scope (breadth and depth) of what students will know, be able to do, etc., upon completion of the degree program. Degree program student learning outcomes:

* Are explicit;
* Are learning-centered (focus on what students learn rather than on what faculty teach);
* Align with the degree program purpose;
* Are appropriate to the level of the degree offered (Master’s degree outcomes would be more rigorous and comprehensive than Bachelor’s degree outcomes, etc.); and
* If a degree program has emphases, the outcomes capture the learning associated with both the common and unique curricular requirements of the degree.

*Rationale*

The primary purpose of Degree Program Student Learning Outcomes is to make teaching and learning purposeful. Learning outcomes provide a framework and a common language that both faculty and students can consistently apply to identify how a course (or even an assignment or learning experience) contributes to the purpose of the degree program.

Effective outcomes facilitate student learning because they build the foundation for the degree program’s curriculum. When used in curriculum design, degree program student learning outcomes:

* Establish the learning priorities of the degree program;
* Communicate a unified vision of what faculty intend students will be able to achieve upon completion of the degree program;
* Tie together learning opportunities within and across courses; and
* Communicate how experiences contribute to and build learning throughout the students’ degree program.

In Backward Design, learning outcomes create a foundation for designing a program, as they identify faculty members’ learning “goals” or “objectives,” which we identify at NAU as “learning outcomes.” By identifying learning outcomes, faculty can then work backwards to develop approaches to instruction and course progression that will achieve their stated learning outcomes for the degree program.

***Review Form Question Prompt***

### 6a. Are the degree program’s student learning outcomes explicit?

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

The primary purpose that NAU expects outcomes to be “explicit” is to ensure outcomes provide enough clarity to support faculty in: (a) the design of the degree program and (b) the design of meaningful assessment measures. Effective outcomes facilitate student learning because they build the foundation for the degree program’s curriculum. When used in curriculum design, degree program student learning outcomes:

* Establish the learning priorities of the degree program;
* Communicate a unified vision of what faculty intend students will be able to achieve upon completion of the degree program;
* Tie together learning opportunities within and across courses; and
* Communicate how experiences contribute to and build learning throughout the students’ degree program.

*Examples*

Two common approaches to ensure outcomes are explicit include the following:

1. Integrating content, skills and purpose of the discipline into a single outcome
2. Developing a broad outcome that is made explicit through clarifying “sub-outcomes”

The first approach is to integrate content and, skills of the discipline into a single outcome. In other words, the content or knowledge of the program is combined with skills or methods of applying that knowledge.

These elements provide students with a context for their learning. In other words, they not only identify content or knowledge that they will learn, but also how they will use that content or for what purpose they are learning the content. At the same time, these elements provide faculty with guidance as far as designing the program’s curriculum. The articulation of program student learning outcomes benefits both students and faculty by making the curriculum more transparent and making expectations across programs and courses more consistent.

In the table below, you will find examples that demonstrate the differences among explicit degree program student learning outcomes, outcomes missing one or more of the important contextual elements, and outcomes providing no context.

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| **Exemplary** | **A little better, but not quite there.** | **Needs Improvement** |
| Economics graduates will be able to perform and interpret quantitative analysis that uses economic data:   * Students can assemble and analyze economic data as well as formulate models to test economic hypotheses. * Students understand the assumptions, applications and outcomes associated with using the basic regression model. * Students will be competent in using a statistical software package in order to undertake and successfully complete quantitatively-based economic analysis. | Use statistical data to make effective decisions in business  *What types of statistics, for what types of decisions, for what types of business goals?* | Demonstrate quantitative reasoning  *Which degree program does this apply to, how does this apply to the context of the learner, and how is the learner going to use this vague ability in the real world?* |
| English graduates will know how to write effectively in several genres and for various purposes—with appropriate design, fluency, voice, style, vividness, self-awareness, and awareness of audience or reader. Graduates will know how to invent, find, develop, and support content relevant for their writing purposes. | Master and employ art historical vocabulary  *In what types of writing and using what types of analysis?* | Possesses written communication skills  *Which degree program does this apply to, how does this apply to the context of the learner, and how is the learner going to use this vague ability in the real world?* |

A second approach is to state a broad learning outcome and provide supporting descriptions of the outcome. Here are some examples of a few outcomes pulled from lists from various academic programs:

Sociology BS

*Critical use of scientific methods to develop empirical explanations of social phenomena by:*

* *Assessing perspectives and approaches best able to research a particular phenomenon;*
* *Developing research designs to discover, describe and/or analyze specific social components;*
* *Applying and utilizing qualitative and quantitative techniques as part of the research design;*
* *Demonstrating effective use of technology to retrieve data and information from databases in order to assess relevant research found in research publications and other sources; and*
* *Analyzing and evaluating data to inform the explanation of the phenomenon being studied.*

Chemistry MS

*Apply appropriate research methods and analysis as evidenced by skills such as:*

* *Planning and carrying out a research project independently;*
* *Demonstrating the ability to be self-critical in evaluating procedures and outcomes;*
* *Taking responsibility for the success of a research project;*
* *Participating and collaborating with members of their research group and with people outside of their group; and/or*
* *Understanding the limitations of the research methods used in their work.*

***Review Form Question Prompt***

### 6b. Are the degree program’s student learning outcomes learning-centered?

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

A learner-centered outcome shifts the focus of the outcome from what the faculty members are teaching to what a student is meant to learn. Since student learning in the academic program is the purpose of curriculum design and assessment at NAU, outcomes are phrased to focus upon what faculty want students learn in the program.

*Examples*

The following example demonstrates how to move the perspective from a teacher-centered approach, and instead, to identify what students will get out of the experience. Writing the outcome from the students' perspective provides a foundation of meaning to which learners can "fasten" the concepts and skills of your discipline.

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| Example of “Exemplary” | Example of “Needs Improvement” |
| The role of evidence and qualitative and quantitative methods in sociology, such that the student will be able to:   * identify basic methodological approaches and describe the general role of methods in building sociological knowledge; * compare and contrast the basic methodological approaches for gathering data; * design a research study in an area of choice and explain why various decisions were made; and * critically assess a published research report and explain how the study could have been improved. | Opportunities to become familiar with research theories and methodologies.  *This approach is entirely teacher-centered, describing what the teacher will cover, not what the student will learn through this experience.* |

Below is an example identifying the difference between a program goal and a degree program student learning outcome.

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| Example of “Exemplary” | Example of “Needs Improvement” |
| Knowledge of the technical aspects of construction and building systems, and energy conservation, as well as working knowledge of legal codes and regulations related to construction, environmental systems, and human health and safety, and the ability to apply such knowledge appropriately in specific projects.  *This is the learning outcome that, if achieved, will ensure students “integrate quickly into the workplace.”* | Graduates will integrate quickly into the workplace or advanced education due to an emphasis on high quality teaching, advising, and mentoring.  *This statement belongs in Purpose Statement of the program because it identifies what is important to faculty in delivering the degree program. It does not describe what students will learn to accomplish this ability.* |

***Review Form Question Prompt***

### 6c. Are the degree program’s student learning outcomes aligned with the degree program purpose?

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

High quality degree program student learning outcomes align with the degree program mission and purpose. The mission and purpose of the degree program defines the future activities for which the degree program is preparing students. Some programs may have multiple potential directions for their students, such as careers, graduate school, or general skills and knowledge that can be applied to a variety of futures. The degree program student learning outcomes should be a natural deeper description of the knowledge and skills (attitudes, ways of knowing, etc.) students will achieve, and through the achievement of those outcomes, they will be successful in the future potential pathways identified by the degree program.

*Examples*

For example, the purpose of the Secondary Education programs is to provide students all of the skills and knowledge they need to become teachers in their specific content area. Learning outcomes in Secondary Education programs encompass all of the skills and knowledge to develop curriculum, assess students' learning, and modify curriculum based on what students have learned. In addition, they include all of the knowledge of the content discipline of the degree program (e.g., English, Biology, Mathematics, etc.).

Another example is Geology. Their mission is to prepare students for three potential areas: further study in Geology, a career in Geology, or going directly into a career that may or may not be related to Geology once they complete their degree. Degrees with broader goals tend to focus more on the elements of critical thinking and how learning how to think critically in the discipline will provide success in a variety of areas. Critical thinking goals show up in the Degree Program Student Learning Outcomes through clearer definitions of the types of analysis and synthesis students learn to engage in.

*English B.A.*

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| Purpose | Associated Learning Outcome(s) |
| Our graduates have developed their historical and cultural imaginations by studying the marks of other times and diverse peoples in language and text | General Knowledge of English:   * Graduates will know how social, cultural, and historical contexts affect personal expression; the reception, comprehension, or study of texts; and specific communication purposes for both writers and readers. Graduates will be conversant with English in global settings and with the increasing impact of international forces—the history and politics of cultural and linguistic diversity, of environmental sustainability, and of globalization—on the discipline of English. |

*Chemistry M.S.*

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| --- | --- |
| Purpose | Associated Learning Outcomes |
| The Chemistry M.S. program prepares students for research-focused professions in the chemical sciences, emphasizing the development of a students' ability to develop experimental approaches that accurately capture information to solve questions and problems in their chemical field of study. | Apply appropriate research methods and analysis as evidenced by skills such as:   * Planning and carrying out a research project independently; * Demonstrating the ability to be self-critical in evaluating procedures and outcomes; * Taking responsibility for the success of a research project; * Participating and collaborating with members of their research group and with people outside of their group; and/or * Understanding the limitations of the research methods used in their work. |

***Review Form Question Prompt***

### 6d. Are the student learning outcomes appropriate for the level of the program (Bachelor’s, Master’s, etc.)?

For example, graduate student learning outcomes describe complex learning that assumes acquisition of lower-level knowledge and skills from a Bachelor’s degree.

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

Being appropriate to the level of the degree is a characteristic required in the Higher Learning Commission’s (NAU’s regional accreditor) core criterion 3.A.1.: Courses and programs are current and require levels of performance by students appropriate to the degree or certificate awarded.

*Examples*

In order to define “levels of performance appropriate to the degree” some faculty groups have turned to the Lumina Foundation’s Degree Qualifications Profile (DQP), which explicitly articulates differentiated learning outcomes for Associate’s, Bachelor’s, and Master’s degrees. A few sections that seemed to be most relevant to the work of the committees is copied and pasted from the Degree Qualifications Profile below. The PDF of the Degree Qualifications Profile is here <https://www.luminafoundation.org/files/resources/dqp.pdf> .

What the following examples explore is the different level of learning between a Bachelor’s and Master’s Degree. Of course, the specific content knowledge of the discipline would need to be included in the outcomes, as well as the specific purpose of learning developed by faculty in the degree program.

**Degree Qualifications Profile Categories:**

|  | **Associate Degree** | **Bachelor’s Degree** | **Master’s Degree** |
| --- | --- | --- | --- |
| **Specialized Learning** | * Describes the scope of the field of study, its core theories and practices, using field-related terminology, and offers a similar explication of at least one related field. * Applies tools, technologies and methods common to the field of study to selected questions or problems. * Generates substantially error-free products, reconstructions, data, juried exhibits or performances appropriate to the field of study. | • Defines and explains the structure, styles and practices of the field of study using its tools, technologies, methods and specialized terms.  • Addresses a familiar but complex problem in the field of study by assembling, arranging and reformulating ideas, concepts, designs and techniques.  • Frames, clarifies and evaluates a complex challenge in the field of study and one other field, using theories, tools, methods and scholarship from those fields to produce independently or collaboratively an investigative, creative or practical work illuminating that challenge.  • Constructs a summative project, paper, performance or application that draws on current research, scholarship and techniques in the field of study. | • Elucidates the major theories, research methods and approaches to inquiry and schools of practice in the field of study, articulates their sources, and illustrates both their applications and their relationships to allied fields of study.  • Assesses the contributions of major figures and organizations in the field of study, describes its major methodologies and practices, and illustrates them through projects, papers, exhibits or performances.  • Articulates significant challenges involved in practicing the field of study, elucidates its leading edges, and explores the current limits of theory, knowledge and practice through a project that lies outside conventional boundaries. |
| **Commu-nication Fluency** | • Develops and presents cogent, coherent, and substantially error-free writing for communication to general and specialized audiences.  • Communicates effectively to general and specialized audiences through structured oral presentations.  • Negotiates with peers an action plan for a practical task, and communicates the results of the negotiation either orally or in writing. | • Constructs sustained, coherent arguments, narratives or explications of issues, problems or technical issues and processes, in writing and at least one other medium, to general and specific audiences.  • Conducts an inquiry relying on non-English-language sources concerning information, conditions, technologies or practices in the field of study.  • Negotiates with one or more collaborators to advance an oral argument or articulate an approach to resolving a social, personal or ethical dilemma. | • Creates sustained, coherent arguments or explanations summarizing his or her work or that of collaborators in two or more media or languages for both general and specialized audiences. |
| **Applied Learning** | • Describes in writing at least one case in which knowledge and skills acquired in academic settings may be applied to a field-based challenge, and evaluates the learning gained from the application using evidence and examples.  • Analyzes at least one significant concept or method in light of learning outside the classroom.  • Locates, gathers and organizes evidence regarding a question in a field-based venue beyond formal academic study and offers alternate approaches to answering it. | • Prepares and presents a project, paper, exhibit, performance or other appropriate demonstration linking knowledge or skills acquired in work, community or research activities with knowledge acquired in one or more fields of study, explains how those elements are structured, and employs appropriate citations to demonstrate the relationship of the product to literature in the field.  • Negotiates a strategy for group research or performance, documents the strategy so that others may understand it, implements the strategy, and communicates the results.  • Writes a design, review or illustrative application for an analysis or case study in a scientific, technical, economic, business, health, education or communications context.  • Completes a substantial project that evaluates a significant question in the student’s field of study, including an analytic narrative of the effects of learning outside the classroom on the research or practical skills employed in executing the project. | • Creates a project, paper, exhibit, performance or other appropriate demonstration reflecting the integration of knowledge acquired in practicum, work, community or research activities with knowledge and skills gleaned from at least two fields of study in different segments of the curriculum and articulates the ways the two sources of knowledge influenced the result.  • Designs and implements a project or performance in an out-of-class setting that requires the application of advanced knowledge gained in the field of study to a practical challenge, articulates in writing or another medium the insights gained from this experience, and assesses (with appropriate citations) approaches, scholarly debates or standards for professional performance applicable to the challenge. |
| **Analytical Inquiry** | • Identifies and frames a problem or question in selected areas of study and distinguishes among elements of ideas, concepts, theories or practical approaches to the problem or question. | • Differentiates and evaluates theories and approaches to selected complex problems within the chosen field of study and at least one other field. | • Disaggregates, reformulates and adapts principal ideas, techniques or methods at the forefront of the field of study in carrying out an essay or project. |
| **Use of Informa-tion Resour-ces** | • Identifies, categorizes, evaluates and cites multiple information resources so as to create projects, papers or performances in either a specialized field of study or with respect to a general theme within the arts and sciences. | • Locates, evaluates, incorporates, and properly cites multiple information resources in different media or different languages in projects, papers or performances.  • Describes characteristics of essential information resources, including their limitations, and explains strategies for identifying and finding such resources.  • Generates information through independent or collaborative inquiry and uses that information in a project, paper or performance. | • Provides evidence (through papers, projects, notebooks, computer files or catalogues) of contributing to, expanding, evaluating or refining the information base within the field of study. |

***Review Form Question Prompt***

### 6e. If a degree program has emphases, the outcomes capture the learning associated with both the common and unique curricular requirements of the degree.

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

Since the Learning Outcomes are meant to define the scope (breadth and depth) of what students will know, be able to do, etc., upon completion of the degree program, then if there are emphasis areas, it makes sense to include a brief summary of those emphasis areas in the Purpose Statement.

*Examples*

*Environmental Sciences & Policy M.S.*

*Science & Policy Emphasis Learning Outcomes*

* Develop an interdisciplinary understanding of environmental systems through coursework and thesis research.
* Develop a personal plan of study and research.
* Apply a core body of methodological and theoretical knowledge to a thesis in the student’s individual area of research interest.
* In the Science & Policy Emphasis, students’ core body of methodological and theoretical knowledge revolves around a scientific examination of natural resources (such as air, water, and land) and integration of this scientific knowledge with an examination of environmental law, regulation and policy.

*Paleoenvironmental Emphasis Learning Outcomes*

* Develop an interdisciplinary understanding of paleoenvironmental systems through coursework and thesis research.
* Examine Quaternary geology including glaciation, hydrology, stratigraphy, geomorphology, and paleoclimatology.
* Elucidate major theories and methods in reconstructing terrestrial and aquatic biotic communities of the past.
* Examine and understand how and why the climate system responds to natural changes and human impacts.
* Use archeological analysis to examine the impacts of humans on past climate and environments.

|  |
| --- |
| Curriculum Map/ Matrix: Question 7 of Plan Form |

***Review Form Question Prompt***

### 7. Does the curriculum map/ matrix reflect the proposed changes to the program?

Yes  Needs Improvement  No

If not, or if the description needs improvement, explain why:

*Rationale*

The purpose of the curriculum map is to ensure that the program’s curriculum has coherent course sequencing and structure designed to achieve the intended student learning outcomes. It presents the important opportunity for both students and faculty to articulate the rationale behind the sequencing and structure of the degree program.

*How-to Guide*

A. First, check to see if all of the degree program student learning outcomes are located on the curriculum map:

1. Compare the list of Degree Program Student Learning Outcomes to the list of outcomes located on the curriculum map.
   1. If any learning outcome is missing, identify the learning outcome under the “Comments” section.
2. Conduct a similar comparison for the emphasis learning outcomes.
   1. If any learning outcome is missing, identify the learning outcome under the “Comments” section.

B. Review the list of courses required for the degree. Are all of the courses required for the degree designated within the Curriculum Map? If they are not, then have the group add the courses to the map.

Compare your response with those in your review group. Together, come to an agreement on the rating of and/or feedback to the unit.