# Guide for Evaluating New Course & Course 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 Course and Course Change Proposal Forms. The purpose of the guide is to make it easier for faculty to review proposals and provide feedback for proposal submissions. Each section contains the original question posed on the New Course or Course Change Form, the rationale for reviewing the section, and examples of excellent responses.

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| Justification: Question 5 of Course Form |

***Review Form Question Prompt***

### 5a. 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.

**5b. Does the justification adequately explain the reasons for a new course or for making a course 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 Course Justifications:*

*Cinema Studies, for the creation of a new CINE 283 course:*

Cinema Studies is a highly diverse field, but NAU’s existing CINE courses offer relatively few options (e.g., CINE 267, CINE 268) for focused study of specific historical periods and political/aesthetic issues in American cinema. (Those that are currently listed in the catalog are rarely offered.) As such, the proposed CINE 283 (Topics in U.S. Film History) is intended as a 200-level counterpart to CINE 383 (Topics in World Cinema), allowing faculty and students greater flexibility in pursuing new directions in the study of American cinema. This course will serve as a key platform for new offerings in Comparative Cultural Studies, and more specifically, the Cinema Studies minor. As a 200-level Liberal Studies (AHI) course focused on American cinema, the course will be a highly appealing elective for students, while also serving as a stepping-stone between other frequently taught offerings like CINE 101 (Introduction to Cinema Studies) and CINE 383. It will also allow a venue for U.S.-related film topics that might have only previously been offered through CINE 383 or ENG 366 (Film as Literature), thus creating space for fruitful interdepartmental connections. Additionally, it will help fulfill a major component of the Cinema Studies minor (Cinema History units) while ideally increasing overall enrollment in said minor. Potential course topics might include: Genre Studies (or genre-specific courses), New Hollywood and the Long 1970s, Cinema in the Digital Age, Race and Ethnicity in U.S. Cinema, LGBTQ Film Studies, Disability in Cinema, et al.

*History, for the creation of HIS 335:*

The current HIS 335 course contains too much material for it to be taught as a 300-level course. Instructors face the option of either teaching it as a survey and sacrificing depth and difficulty, or teaching to the level and omitting material mentioned in the course description. By splitting the course into two separate courses, HIS 333 and 335, 300-level rigor and the chronological span of Greek history can both be covered. There is also no reason to encourage students to take 240 before taking this course. Since it is not required, the course must be taught as if students have no previous knowledge on the subject, which is true for most students taking it.

*Psychological Sciences for a new PSY 231 elective course:*

Students who take a statistics course at another college or university and transfer to NAU often lack the lab component and training in SPSS (a statistical computer program) that students who take the current required statistics course in psychological sciences at NAU (Psy 230) have. This places the transfer students at a disadvantage compared to other students when they take our research methods course (Psy 302W) and other upper-level courses that require knowledge of statistics and the SPSS computer program. The purpose of this online lab course is to help students who transfer in refresh their knowledge of statistics from their previous course, and also to help them develop a knowledge of SPSS that will enable them to succeed in our Psy 302W course and in other upper-level courses that involve using SPSS at an equal level to the students who take Psy 230 at NAU.

*Excellent Examples of Course Change Justifications:*

*Mechanical Engineering: Changing 180 from two units to three units:*

This is an important change that aligns the faculty teaching load and students’ workload with the number of credit hours stated in the catalog. In the past, the course was taught as a 1+1 (lecture+embedded lab). However, due to time and space limitations in our computer lab, we have reformatted the course to more effectively use the in-class time, while still allowing students to have enough hands-on experience. So, we have increased the number of lecture hours to 3, including practice exercises and in-class activities. The class meets for 150 min. per week for lecture. Additional practice exercises, lessons, and tutorials are provided online. The content of the course is now equivalent to 3 units of lecture, and the course credit hours should be increased to 3 to reflect the actual course content.

*Secondary Education-Physical Education: PE 316-Elimination of a pre-requisite.*

This course is a content progressions course where students see multiple sports, games and activities modeled and taught at a K-12 level. This course is very hands on. The short and long term plans for this unit is to increase the number of majors into the Physical Education Program. The class is currently meeting for the standard times of a 3 semester hour course. Students meet Tuesday/Thursday from 9:35-10:50. Students are required to do a technology integration project (alignment to national standards) and an advocacy project. Both of these take an extensive amount of time outside of the scheduled meeting time. Students will immediately gain a strong interest in the profession and be enticed to take other PE courses. Historically the textbook adoption for this course was very expensive. This is something else that will be eliminated in hopes of recruiting more students. This course can be taught with no textbook. All that is needed is a quality, trained physical educator as the staff and the equipment we currently have. Currently the course is only 2 credits. I feel historically this was done to decrease the number of credit hours for the major. The goal and expectation is to keep the number of credits identical. By eliminating one of the PES requirements and making PE 316 a 3 credit course we are being fair to the students, teachers and time commitment that it takes to teach this course effectively. By making this course a 3 credit hour course and offering it at a standard academic time, the goal is to increase the number of student interested in the program and ultimately increase the number of students completing the PE major.

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| Syllabus Review: Course Purpose |

## Introduction to the Course Purpose Statement

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

* The content studied, skills developed, and/or the learning experiences provided, and
* The role the course plays in the academic programs it serves. Examples:
  + “foundation for [BLANK] type of future work in the degree program”
  + “builds upon what you did in [BLANK] course so that you can do [BLANK]”
  + “builds toward your ability to do [BLANK] in [BLANK] future course”
  + “addresses the [BLANK] Distribution Block of the Liberal Studies Program by examining [BLANK].”
  + “addresses the [BLANK] Diversity Requirement by examining [BLANK].”

*Rationale*

Understanding and articulating a course’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 course, as studied by the academic unit, summarizing what and how students will learn within the course, and expresses the future opportunities students will be prepared to achieve upon completing the course. 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 course.

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

***Review Form Question Prompt***

## P1: Does the course’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 course.

*Examples*

*GSP 272: Nature & Society*

*The underlined section identifies the content studied, skills developed and/or learning experiences provided.*

This course serves as an introduction to how humans relate to the nonhuman world. More specifically it will analyze how humans affect nature and how nature affects society. Throughout the semester we will examine what factors coalesce to create environmental problems, how humans relate to those problems and the environment more generally, and what role values play in addressing and creating environmental harms. The course will survey major topics in environmental studies, using key readings to supplement the textbook. Additionally, this course affords the opportunity to engage with topics, themes, and frameworks that emerge from Geography and other disciplines.

Nature and Society is a liberal studies course in the Social and Political Worlds block. The course focuses particular attention on how political and economic systems have shaped environmental and social outcomes. It will provide insights into different theoretical approaches for understanding and studying human behavior in relation to dominant political, economic and social systems. Critical Geography sheds light on power relations within society and showcases how power differentials render some segments of society more vulnerable to environmental harms than others. Course components, including lectures, assignments, and discussion, develop various skills but focus on effective writing essential skill.

*CIT 610: Principles of Information Technology Project Management*

*The underlined section identifies the content studied, skills developed and/or learning experiences provided.*

This course examines the underlying principles of project management such as project management theory and project management frameworks, the roles of project managers and staff, challenges associated with project management, ethical considerations, and how those concepts are applied to the domain of information technology.  The application of project management to the domain of information technology is important because projects are frequently technology-focused which tends to increase project complexity. In addition, this course is a first in a series that introduces students to the Project Management Institute’s PMBOK® framework, knowledge areas, and process groups. This course targets skills associated with project initiation which is a necessary first step in project management. Students will apply their knowledge and skills to create a project charter for an information technology project following the specifications outlined in the Project Management Institute’s PMBOK® framework. Students will build upon this course during the remainder of their program by exploring additional Project Management Institute PMBOK® framework components.

*NUR 605: Graduate Research Seminar*

*The underlined section identifies the content studied, skills developed and/or learning experiences provided.*

The purpose of this course is to reinforce prior learning of the translation of scientific research findings into an evidence-based leadership project. Learners will be introduced to the parallels of project development, and that of the nursing process. In this course, students will initiate or design their project, as well as a proposed implementation plan. Key project deliverables will include: the identification of a specific and measurable leadership problem, the significance of the problem as well as identified best practices as found in the scientific and academic literature, the purpose statement, as well as project SMART goals. Learners will be expected to identify internal and external stakeholders that will serve as facilitators for the project implementation plan, and assess congruence of the proposed project outcomes with the organizations strategic mission and plan. Upon successful completion of this course learners will be provided the opportunity to implement their capstone project proposal in an actual organizational setting through the supervision of a joint organizational and faculty mentor.

*NUR 650: Advanced Nursing Assessment*

*The underlined section identifies the content studied, skills developed and/or learning experiences provided.*

The purpose of this course is to provide the graduate nursing student with an expansion of acquired basic health assessment and physical examination skills. Advanced cognitive and psychomotor skills allow students the opportunity to practice using a diagnostic reasoning process. In this course, students will learn techniques and theory underpinning the biophysical an psychosocial findings in patient-centered care in health, well-being, and illness across the lifespan. Additionally students will integrate comprehensive health assessment and physical examination findings as a foundation for clinical decision making. Using information technology and systems, students will document and communicate patient data, they will then synthesize this data along with clinical judgment, supported by current evidence into patient plans of care for health promotion and improving patient outcomes. Finally, students explore the image and roles of the advanced practice nurse integrating advanced assessment and diagnostic reasoning in primary care, rural healthcare, health promotion, and patient education. Key learning strategies include systematic acquisition of psychomotor techniques learned through reading, watching video, and through participation in face-to-face skills lab practice. Understanding of clinical reasoning is supported through comprehensive patient case presentations which take place via asynchronous group discussions. The scholarly project for this course consists of the student being evaluated, either live or via video, for performing a comprehensive head-to-toe physical examination of a ‘patient’. This course prepares graduate nursing students for advanced roles in nursing that include education, administration, and clinical practice.

***Review Form Question Prompt***

## P2.Does the academic program’s purpose statement adequately summarize the role the course plays in the academic programs it serves?

Yes  Needs Improvement  No

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

*Rationale*

The purpose of articulating the role the course plays in the academic programs it serves is to address an important concept of Backward Design. Backward Design recommends that faculty design a course’s curriculum by first setting the goals of the course, then working backward to develop approaches to instruction and topic/skill progression that will achieve those goals. The “goals” of the course are typically defined through identifying the role the course plays in the academic programs it serves. For example, if the course is an introduction to the discipline, it will most likely establish the discipline’s key theories, historical debates, and/or key concepts. Junior Level Writing courses focus on writing. Capstone courses provide culminating experiences.

*Examples*

*GSP 272: Nature & Society*

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| Syllabus Review: Course Learning Outcomes |

## Introduction to the Course Learning Outcomes

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

* Are explicit;
* Are learning-centered (focus on what students learn rather than on what faculty teach);
* Align with the course 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

*Rationale*

The primary purpose of Course 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 the instruction, assignments and work in the course contributes to the course’s purpose.

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

* Establish the learning priorities of the coruse;
* Communicate a unified vision of what faculty intend students will be able to achieve upon completion of the course;
* 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 design sequencing that will achieve their stated learning outcomes.

***Review Form Question Prompt***

## LO1. Are the course’s learning outcomes explicit enough to be assessed, measured, or observed?

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

*Examples*

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

1. Integrating content and skills of the course 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 course into a single outcome. 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 course’s curriculum. The articulation of learning outcomes benefits both students and faculty by making the curriculum more transparent and making expectations across class sections of the same course 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** |
| Upon completion of the course students will be able to:   * Assemble and analyze economic data as well as formulate models to test economic hypotheses. * Understand the assumptions, applications and outcomes associated with using the basic regression model. * Use a statistical software package in order to undertake and successfully complete quantitatively-based economic analysis. | Upon completion of the course students will be able to:  Use statistical data to make effective decisions in business  *What types of statistics, for what types of decisions, for what types of business goals?* | Upon completion of the course students will be able to:  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?* |
| Upon completion of the course, students will  - write effectively in several genres and for various purposes—with appropriate design, fluency, voice, style, vividness, self-awareness, and awareness of audience or reader.  - Be able to invent, find, develop, and support content relevant for their writing purposes. | Upon completion of the course, students will:  Master and employ art historical vocabulary  *In what types of writing and using what types of analysis?* | Upon completion of the course, students will:  Possess 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 Course*

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 Lab Course:*

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***

## LO2. Are the course 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 to 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.

| **Excellent Learning Outcomes** | **These Need Improvement** |
| --- | --- |
| By the end of the semester, students in this course will:  - Apply foundations of research and the scientific method to business problems in IT.  - Outline the phases of research with respect to solving a business problem with IT.  - Explain the need for Ethical Considerations in Research and how Ethics applies to IT research.  - Construct an argument for using Institutional Review Boards when conducting IT research in business or academic settings.  - Discriminate between qualitative and quantitative research providing examples in IT.  - Evaluate tools appropriate for managing references as well as manipulating statistical data.  - Devise a framework for conducting a literature review and annotated bibliography.  - Differentiate between good and poor research, and identify attributes of research to assist with the classification.  - Construct a research proposal oriented toward solving a business problem using IT. | 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.* |

***Review Form Question Prompt***

## LO3. Are the course’s learning outcomes aligned with the course 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.

*GSP 272: Nature & Society*

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| **Course Purpose** | **Associated Learning Outcome(s)** |
| This course serves as an introduction to how humans relate to the nonhuman world. More specifically it will analyze how humans affect nature and how nature affects society. Throughout the semester we will examine what factors coalesce to create environmental problems, how humans relate to those problems and the environment more generally, and what role values play in addressing and creating environmental harms. | 1) Explain environmental issues, their causes, and potential solutions  2) Assess the affect political and economic institutions have on individual and collective decision-making  3) Critically reflect on existing perspectives regarding the human relationship to the environment  4) Critically analyze information and make persuasive arguments based on that information, both orally and in writing (Effective writing essential skill)  5) Demonstrate critical geography insights and theories to investigate power and its consequence on environment and society |

*INF 376: Research Initiation*

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| **Course Purpose** | **Associated Learning Outcomes** |
| In preparation for a culminating one-year research Capstone experience, students embed in a research lab for one year. Students learn current research, lab practice, and informatics techniques in Biology, Ecology, or Astronomy. The focus in this first year is learning research and lab techniques, experimental design, and team work in a lab context.  This course is the second in a two semester Research Experience sequence (INF376 and INF386), which in turn prepares students for the two semester capstone sequence (INF476C and INF486C). As the second course in the sequence, this course requires that students engage in more independent thinking and practice than INF376. This course is intended to be taken by a junior level student with significant core and emphasis area course work completed. | CO1. Apply and relate fundamental methods of informatics to emphasis area problems. Students should use informatics methods specific to their emphasis area towards understanding and investigating research problems.  C04. Engage in effective research teamwork with a focus on coordination and interpersonal processes. Students are expected to participate as part of a research teams that may often be associated with a formal lab or a less formal collective of graduate students, scientists and software developers. In this course students will engage in team coordination practice and interpersonal processes such as conflict management.  C05. Engage in effective written and oral communication that communicates qualitative and quantitative data, develops hypothesis, and communicates accomplishments. Students are required to write experience reports that communicate research problems and their accomplishments. This supports BSI learning outcome L06. |

***Review Form Question Prompt***

## LO4. Are the student learning outcomes appropriate for the positioning of the course within the curriculum?

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 positioning of the course in the curriculum” 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:**

|  | **100-200 level** | **300-400 level** | **500-700-level** |
| --- | --- | --- | --- |
| **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. |

|  |
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| Syllabus Review: Course Assignments/Assessments |

## Introduction to the Course Assignments/Assessments:

Assignments (assessments of student learning) should reveal how well students have learned what we want them to learn. Aspects of course design, and instruction itself, ensures that students learn the outcomes. For this to occur, assessments (assignments), learning outcomes, and instructional strategies need to be closely aligned so that they reinforce one another.

***Review Form Question Prompt***

**A1. Are all of the outcomes addressed by the assignments/ assessments?**

Yes  Needs Improvement  No

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

*Rationale*

At NAU, we define assessment as any task wherein students demonstrate how well they have learned a concept, skill, or other type of learning outcome. An assessment is simply an evaluation of how well students have learned. Tasks used by faculty to ascertain student’s learning are more commonly called “assignments (projects, essays, quizzes, participation, etc.).” If a course learning outcome is not addressed by an assignment/assessment, then there is no way to know how well students have achieved the outcome. As such, an indicator of good course design is the presence of some type of assignment or assessment for each learning outcome covered by the course.

*Examples*

*Forestry 692*

| **Learning Outcomes** | **Assignments** |
| --- | --- |
| Students successfully completing this course will have ability to:  (a) prepare a scientific/professional abstract,  (b) prepare and present a poster presentations  (c) prepare and present a professional talk, and  (d) develop a professional web site. | To pass the course, students must satisfactorily complete each of the following activities and assignments:  1) Attend all classes unless an excused absence  2) Prepare a 200-word abstract for your poster/talk following the attached guidelines. Students will need to revise their abstract until acceptable, and include the abstract with their poster.  3) Prepare and present a computer-generated 36” x 42” poster of your research developed with Powerpoint. Students will give a 5-minute presentation of their poster and receive feedback from classmates and instructors. Students will revise their poster based on comments from classmates and instructors and present a final poster at the end of the semester. The purpose of this assignment is to gain experience with producing and presenting posters, an integral part of many professional meetings.  4) Review and comment on posters prepared by your classmates.  5) Prepare and present a three-minute talk on all aspects of your research (i.e., introduction, methods, results, discussion and conclusions) using the in-class computer/projection system. This form of research communication is aimed at developing academic, presentation, and research communication skills and supports the development of research students' capacity to effectively explain their research in three minutes in a language appropriate to an intelligent but non-specialist audience.  6) Review a video tape of your three-minute presentation and the written review comments from the instructors/classmates and submit a written self-evaluation of your presentation, including changes you would make to improve your presentation. This assignment is due one week after your presentation  7) Prepare and present a 12-minute talk (15 min total time) on all aspects of your research (i.e., introduction, methods, results, discussion and conclusions) using the in-class computer/projection system a language appropriate to a forestry educated audience. The purpose of this assignment is to gain experience using the computer/projection system and Powerpoint, experience presenting at a scientific conference, and gather ideas from other students on how to improve your presentation. Your presentation will be reviewed by instructors/classmates.  8) Prepare and present a revised/improved version of your poster to the class. You must pass this final poster presentation with a grade of 80% or better based on evaluations by classmates and faculty using the attached poster evaluation criteria.  9) Develop a two-page or more website for your research project with a link to your CV (word document or pdf).  10) Present your poster in the School of Forestry atrium at the poster session scheduled for the course at end of the semester. |

*MOL 515 Principles of Leadership*

*In this example, the learning outcomes connected to each assignment are identified numerically at the end of the assignment description.*

Written assignments will be submitted as MS Word documents or PDFs, dropped in the assignment drop boxes when and as directed.

Academic Leadership Article Review 10 points

Search academic articles on leadership styles and write a review to be shared with colleagues. (Learning Outcomes 2, 5 and 6)

Strength Building Assessment 10 points

An individual leadership style assessment will be taken and scored. A paper will be written on what was learned from the assessment that includes a plan for personal development based on building on individual strengths and competencies.

(Learning Outcomes 1, 3, 4 and 6)

Leadership Styles Assignment 10 points

Read *Primal* *Leadership: Realizing the Power of Emotional Intelligence* and discuss leadership styles and reflect on Emotional Intelligence. Select personally resonate style and style(s) to work toward and outline a personal leadership improvement plan. (Learning Outcomes 1,2, 3, 4 and 6)

Leadership Challenge Assignment 10 points

Read *The Leadership Challenge* and write a paper on the most personally salient concepts from that book. Prepare questions for the Leadership Interview based on this paper. (Learning Outcomes 1,2, 3, 5 and 6)

Leadership Interview 10 points

Interview a respected leader and write a paper on that interview that is grounded in an understanding of *The Leadership Challenge*. (Learning Outcomes 6 and 7)

Personal Leadership Vision Statement 5 points

From the introductory discussion of the strategic planning process write a paper on a vision for the future. From this paper craft a three sentence maximum personal vision statement. (Learning Outcomes 1, 4 and 6)

Professional Development Plan Portfolio 10 Points

From the vision statement and the work in this course create a three-year plan utilizing SMART Goals, as well as a resume, and letter of application for a future leadership position. (Learning Outcomes 1,2, 3, 4, 5 and 6)

Discussions 20 Points

Discussions each week will be on the subject covered in that week’s learning module. Students receive points for thoughtful primary contributions and follow up discussions. To earn discussion points, along with thoughtful analysis, direct quotes from the week’s reading must be well integrated into both the primary and follow up discussion posts.

(Learning Outcomes 1,2, 3, 4, 5, 6 and 7)

Reflective Practice Journal 15 Points

Each week questions related to the topic at hand are posed for private (between the instructor and the student) consideration. These musings are more informal than the papers or discussion posts and are intended to synthesize the work and the student’s thoughts about the work. (Learning Outcomes 1,2, 3, 4 and 5)

Total 100 Points

*PSY 101: Introduction to Psychological Sciences*

*In this example, a table is used to connect the department’s learning goals to the course’s learning outcomes and assignments/assessments.*

|  |  |  |
| --- | --- | --- |
| **Departmental Goals** | **Course Learning Outcomes** | **Course Key Assessments & Performances** |
| Goal 1: Knowledge Base in Psychology  \*Social and Political Worlds distribution block designation: explores how different empirical and theoretical strategies are used to study human behavior and social, and cultural systems. | Develop a deeper understanding of the discipline of psychology by recognizing and explaining the terminology and methods used, and being able to describe the major theoretical frameworks in psychology.  Be able to describe the scientific methods utilized to study behavior and mental processes as well as the necessity of a multi-faceted approach to understanding behavior and mental processes.  Gain an increased knowledge of real-world applications of psychology and (hopefully) an increased curiosity toward psychological topics. | In-class activities/assignments, written assignments, and the myth project will help students develop a knowledge base in psychology. The course quizzes and examinations will serve as additional methods for both learning and assessing this knowledge. |
| Goal 2: Scientific Inquiry & Critical Thinking (LS Essential Skills) | Develop analytic and critical thinking skills, and be able to use technology to present information pertaining to psychology. | The practical application assignments, reflection assignment, and conduction of a myth project will allow students to develop and utilize skills related to scientific inquiry and critical thinking. |
| Goal 3: Ethical & Social Responsibility in a Diverse World | Build and maintain high standards for academic integrity. | The academic integrity training will teach students about ethical responsibilities related to academic integrity. |
| Goal 4: Communication | Develop the ability to effectively communicate about psychological phenomena through written communication. | The practical application assignments, reflection assignment, and myth project will teach students how to effectively communicate about psychological phenomena and the importance of tone and audience when communicating ideas. |
| Goal 5: Professional Development | Develop the ability to understand and present on information related to psychological phenomena as well as understand the importance of these skills to one's professional development/career.  Collaborate successfully on small group assignments and/or projects. | The necessity to work as part of group to on the myth project will teach students teamwork skills and the importance of working in groups, which will help students hone skills related to professional development. |

*SUS 601: Visions of Sustainable Communities*

*This example identifies the assessments of the outcomes within the Course Learning Outcomes section, then follows up later with the description of the assignments.*

**Course Learning Outcomes and Assessment**

When the course is completed, students will be able to:

1. Define, examine and apply various interdisciplinary definitions and conceptions of sustainable communities

*Assessment*: Exams and a final paper

1. Identify, question, and transform power dynamics between environmental, economic, ecological, and social factors that foster or inhibit sustainable communities.

*Assessment*: Class discussion, response papers, and final paper.

1. Name, describe, and interpret positioning self along lines of differences and lived experiences vis-à-vis sustainable communities

*Assessment*: Class discussion, response papers, and final paper.

1. Work collaboratively along lines of difference (e.g. race, class, gender, etc.) in classrooms and communities.

*Assessment:* Class discussion and peer evaluations

1. Foster and develop strong interpersonal, listening, and leadership skills.

*Assessment*: Class discussion and peer evaluations

1. Facilitate and create inclusive, diverse, egalitarian, and democratic spaces in the classrooms and communities.

*Assessment*: Class participation

**Assessment of Student Learning Outcomes**

The following represents the method for assessment.

*Seminar Facilitation***:** In pairs, students will take responsibility for facilitating two seminars during the semester. This should be a deeply cooperative learning endeavor for you. You will want to meet well in advance, have a robust discussion about the reading, identifying key themes, questions, dialogues, insights, problems etc. How you present the material and facilitate discussion is up to you. Think about developing insights, posing questions, extending relationships between the current week’s readings and ideas and arguments from other readings, making connections with threads of debate and concern that have been surfacing in seminar discussions, etc. Be provocative, exciting, risk-taking, curious, passionate, sharp and imaginative in your engagements with the work and your facilitation of the group! The quality of your work here is vital to the quality of our seminar conversations. Presentations should be about 15 minutes long, but the questions and insights you offer should keep us going for at least an hour. This assessment will help students develop critical presentation skills. (50 points)

*Critical Analysis***:** Students will write four critical analysis paper. The point of this analysis is to engage the reading for purposes of illuminating its subject matter. Your analysis should have three components: 1) introductory paragraph with information about the book (title, author, publication info, topic and purpose of the book), and a thesis statement indicating your primary reaction to the book; 2) a paragraph summary description of the work; 3) your evaluation of the book. These papers are different from the response papers in that the focus is not on your response to one reading but rather focus on your analysis of the ideas across several books. Its aim is to help the student develop the skill necessary to synthesis concepts. (100 points)

*Response Papers*: Students will write a two-page critical response paper each week. The response paper should demonstrate your understanding of the main arguments of the readings and then critically evaluate them. Since the readings will be complex, you will need to be selective in what you write. In other words, you will not be able cover all of the ideas presented to you each week. Thus, it is important to pick out important themes, interesting ideas, or useful concepts.

Response papers will be graded on how effectively they engage the reading assignments, the quality of thought demonstrated, and the level of your writing.  In other words, you will be graded not on your opinions, beliefs or values, but on the coherence of your thought process, on how well you can critically engage the ideas. Producing this kind of paper is difficult and requires hard work. Don’t be surprised if you do not get it correctly the first couple of time. In those cases, the instructor will work closely with to help you.These papers will be worth 140 points total.

*Peer Evaluations:*Students will respond twice to peers’ Reading Responses. Write a good page. Read carefully and think expansively about what they are writing about. Endeavor to enlarge their thinking if you think theirs falls short in some respect. Draw on course materials and class discussions, among other sources to do this. Raise one or more potent question you think your peer should engage and give some indication of why. (50 points)

*Final Seminar Paper:*Each student will write a 10-page seminar paper. These papers should engage the meaning of sustainable communities, looking at various definitions and applications of the concept. Papers should draw on at least two of the paradigms or frameworks from part two of the course. The student will develop paper idea according to your concerns and interests in consultation with the instructor. (150 points)

*Class Participation:* Because the material in this course is intensive, it is important that students attend class regularly and participated continually so that they can benefit from class discussion. Students are expected to actively participate in group and class discussions throughout the course. At the end of the semester, the instructor will assess your participation by asking the following questions: Does the student come to class prepared and ready to make comments backed up by the text? Are the student’s comments relevant to the day’s readings and discussion? Does the student engage the material and make connections with larger themes we’ve seen in prior readings? (100 points)

*Exams*: There will be two exams in this class. The exam will be an in class test scheduled during mid-term and finals week. The exam will consist of four essay questions, from which the student will answer two. (100 points for each exam, total 200 points)

**A2. As a whole, do the assignments/ assessments align with the outcomes? For example, is there an adequate explanation of the purpose of the assignments/assessments and their connection to learning?**

Yes  Needs Improvement  No

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

*Rationale*

Examining whether assignments/assessments align with outcomes ensures that the tasks selected as assignments will reveal what and how well students have achieved the course’s learning outcomes. If assessments are not aligned with or misaligned with learning outcomes, it can undermine both student motivation and learning. Consider these two scenarios:

* Your outcome is for students to learn to apply analytical skills, but your assessment measures only factual recall. Consequently, students hone their analytical skills and are frustrated that the exam does not measure what they learned.
* Your assessment measures students’ ability to compare and critique the arguments of different authors, but your instructional strategies focus entirely on summarizing the arguments of different authors. Consequently, students do not learn or practice the skills of comparison and evaluation that will be assessed.

*Examples*

*INF 376: Research Initiation*

|  |  |
| --- | --- |
| **Learning Outcomes** | **Assignments** |
| CO1. Apply and relate fundamental methods of informatics to emphasis area problems. Students should use informatics methods specific to their emphasis area towards understanding and investigating research problems.  C04. Engage in effective research teamwork with a focus on coordination and interpersonal processes. Students are expected to participate as part of a research teams that may often be associated with a formal lab or a less formal collective of graduate students, scientists and software developers. In this course students will engage in team coordination practice and interpersonal processes such as conflict management.  C05. Engage in effective written and oral communication that communicates qualitative and quantitative data, develops hypothesis, and communicates accomplishments. Students are required to write experience reports that communicate research problems and their accomplishments. This supports BSI learning outcome L06. | Written deliverables (supporting effective writing)  - Lab Notebook  - Mid-term Research Experience Report  - Final Research Experience Report |

*GSP 272: Nature & Society*

|  |  |
| --- | --- |
| Learning Outcomes | Assignments |
| 1) Explain environmental issues, their causes, and potential solutions  4) Critically analyze information and make persuasive arguments based on that information, both orally and in writing (Effective writing essential skill) | Assignment: What is your ecological footprint?  Follow the prompts at the [website provided] and calculate your ecological footprint. Write up your findings: 1) describe the ecological footprint concept and what it attempts to do; 2) describe the breakdown of your ecological footprint (describe generally what you entered in each section and the final pie chart that describes your footprint; 3) discuss ways that you could reduce your footprint; 4) discuss limitations to the ecological footprint; and 5) discuss whether you think the ecological footprint concept has merit, whether it is an effective means by which to persuade people to reduce change their habits, and what values are embedded in this type of analysis. |

From the Eberly Learning Center:

<https://www.cmu.edu/teaching/assessment/basics/alignment.html>

| **Type of learning outcome** | **Examples of appropriate assessments** |
| --- | --- |
| **Recall Recognize Identify** | Objective test items such as fill-in-the-blank, matching, labeling, or multiple-choice questions that require students to:   * recall or recognize terms, facts, and concepts |
| **Interpret Exemplify Classify Summarize Infer Compare Explain** | Activities such as papers, exams, problem sets, class discussions, or concept maps that require students to:   * summarize readings, films, or speeches * compare and contrast two or more theories, events, or processes * classify or categorize cases, elements, or events using established criteria * paraphrase documents or speeches * find or identify examples or illustrations of a concept or principle |
| **Apply Execute Implement** | Activities such as problem sets, performances, labs, prototyping, or simulations that require students to:   * use procedures to solve or complete familiar or unfamiliar tasks * determine which procedure(s) are most appropriate for a given task |
| **Analyze Differentiate Organize Attribute** | Activities such as case studies, critiques, labs, papers, projects, debates, or concept maps that require students to:   * discriminate or select relevant and irrelevant parts * determine how elements function together * determine bias, values, or underlying intent in presented material |
| **Evaluate Check Critique Assess** | Activities such as journals, diaries, critiques, problem sets, product reviews, or studies that require students to:   * test, monitor, judge, or critique readings, performances, or products against established criteria or standards |
| **Create Generate Plan Produce Design** | Activities such as research projects, musical compositions, performances, essays, business plans, website designs, or set designs that require students to:   * make, build, design or generate something new |

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| Syllabus Review: Co-Convened Courses |

## Introduction to Co-Convened Courses:

*Rationale*

*From the Policy on Co-Convening and the Best Practices and Examples for Co-Convened Courses*

Co-convening of courses allows flexibility at no additional cost. It also allows for more interaction between undergraduate and graduate students. This can strengthen the undergraduate experience (“raise the level of the class”), but may water down the graduate experience. However, if courses are carefully designed (for example, where graduate students mentor undergraduates in a structured manner) it can also strengthen the graduate experience.

Undergraduate and graduate sections of co-convened courses must have separate syllabi. With all academic standards in the course which include, but are not limited to: course learning outcomes, assignments, discourse, analysis, and overall expectations; the level of complexity, nuance, application, and interpretation of the course material for graduate students must be a markedly higher level to ensure the course is a true graduate experience for the students.

Graduate students will complete work that is appropriately higher in quality (i.e. increased difficulty) and quantity (i.e. additional work beyond that required by undergraduates), which will be described and qualified in writing by the instructor. Specific quantity is not necessarily the only indicator of graduate-level work, it is generally encouraged that graduate students should be required to complete approximately one-third more work in the course.

It should be apparent from comparison of the undergraduate and graduate syllabi that the graduate students are held to higher standards of professionalism than their undergraduate classmates.

***Review Form Question Prompt***

### CC1. Are the intended course learning outcomes differentiated between undergraduate and graduate study?

* Graduate outcomes contain language that indicates a higher degree of rigor for the graduate experience and specifics that indicate a greater intellectual engagement (provide greater depth, breadth, higher levels of learning and impact, etc.) as compared to undergraduate outcomes.
* Undergraduate outcomes clearly identify discipline-specific approaches to analysis, evaluation, synthesis and application; new understanding and comprehension tends to be gained through active learning and experiences of content knowledge in the field.

Yes ☐ Needs Improvement ☐ No ☐

If not, or if it needs improvement, explain why:

*Example*

|  |  |
| --- | --- |
| **PHY 482 Course Learning Outcomes** | **PHY 582 Course Learning Outcomes** |
| By the end of the class, students will be able to:  • explain how nanoscale features of materials leads to unique properties that are not seen in their bulk counterparts  • solve advanced problems in nanoscale solid state physics from an analytical perspective and by interpreting real experimental data – techniques utilized for the study of nanoscale materials will be learned in conjunction with the interpretation of experimental data  • communicate advanced topics in nanoscale solid state physics in both scientific and lay terms | By the end of the class, students will be able to:  • explain how nanoscale features of materials leads to unique properties that are not seen in their bulk counterparts  • solve advanced problems in nanoscale solid state physics from an analytical perspective and by interpreting real experimental data – techniques utilized for the study of nanoscale materials will be learned in conjunction with the interpretation of experimental data  • research current literature on advanced solid state physics with a special emphasis on nanoscale materials  • communicate advanced topics in nanoscale solid state physics through a publication-quality research paper, and an oral presentation  • organize group projects on advanced topics in solid state physics and take a leadership role with undergraduate students  • lead class discussions on advanced nanoscale solid state physics |

***Review Form Question Prompt***

**CC2. Are the assignments/ assessment within the course differentiated between undergraduate and graduate study?**

* Graduate assignments provide higher levels of learning and impact, with more complex, nuanced, and advanced application of concepts as compared to undergraduate assignments. Assessments indicate an assumption of an advanced application of skills to achieve outcomes (i.e. graduate-level writing, oral skills, analysis, etc.).
* Grading systems for graduate assignments/ assessments reflect higher levels of rigor as compared to undergraduate assignments/ assessments.

Yes ☐ Needs Improvement ☐ No ☐

If not, or if it needs improvement, explain why:

*Example*

|  |  |
| --- | --- |
| **PHY 482 Assignments/Assessments** | **PHY 582 Assignments/Assessments** |
| Assignments: We will have homework and quizzes over the topics listed below. I encourage you to work with your classmates on the homework assignments. A comprehensive final exam will also be given.  Grades: A (90-100%), B (80-89%), C (65-79%), D (50-64%), & F (<50%)  Breakdown: 40% Homework; 40% Quizzes, 15% Final Exam, & 5% participation including the final project headed by a graduate student. Attendance may be used for borderline cases. | Assignments: We will have homework and quizzes over the topics listed below. I encourage you to work with your classmates on the homework assignments. Graduate students will also have additional homework problems that will be more advanced than the problems the undergraduate students will perform. A comprehensive final exam will also be given.  Final Paper, presentation, and leadership: As a co-convened class, graduate students will be required to write a research paper to be due at the end of the semester on a current topic in solid state research. The paper will include a comprehensive literature search and discussion of the topic in detail. An accompanying presentation of the paper will be additionally required, that will include leading a small group of undergraduate students. Graduate students will be required to lead and organize the presentation, and will also lead class discussions on their topic of specialization throughout the semester.  Grades: A (90-100%), B (80-89%), C (65-79%), D (50-64%), & F (<50%)  Breakdown: 30% Homework; 30% Quizzes, 20% Final Exam, & 20% Final Project. Attendance may be used for borderline cases. |

***Review Form Question Prompt***

**CC3. Are the readings/ materials within the course differentiated between undergraduate and graduate study, such that the types and quantity of graduate reading materials provide greater depth, breadth, higher levels of learning and impact, etc. as compared to undergraduate readings/ materials?**

Yes ☐ Needs Improvement ☐ No ☐

If not, or if it needs improvement, explain why:

*Example*

|  |  |
| --- | --- |
| **PHY 482 Readings/Materials** | **PHY 582 Readings/Materials** |
| • Introduction to Solid State Physics, by Charles Kittel  • Introduction to Nanoscale Science and Technology, by Di Ventra, et al. | • Literature from physics journals such as Physical Review Letters, American Journal of Physics, and others.  • Introduction to Solid State Physics, by Charles Kittel  • Introduction to Nanoscale Science and Technology, by Di Ventra, et al. |