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> Curriculum Design (/hc/en-us/sections/201380376-Curriculum-Design)

Designing an Online Curriculum

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Learn about:

- Planning and designing a course that meets the unique needs of Coursera learners
- Defining specific, action-oriented learning objectives for lessons, units or modules, and the course as a whole
- Creating an assessment plan that includes a variety of formative and summative assessments



For a checklist-style overview of this topic, consult the Curriculum Design Checklist (/hc/en-us/articles/204307225#header_8) at the end of this article.

Overview

Most instructors spend considerable time on course planning and design before creating videos, assessments, and other resources for a new online course. The planning and design phase usually involves articulating learning objectives,

storyboarding video lessons, and outlining the number and type of assessments included in each section of the course.

A thoughtful planning and design process results in a course that is well organized, feels cohesive, and effectively supports a diverse group of online learners. Careful planning will also ensure a smoother course production timeline, with less chance of last-minute changes and additions before the course opens.

This document introduces an online course planning process grounded in two goals:

- Teach learners with diverse motivations and backgrounds, and
- Support mastery learning.

The first section sets context by providing basic information about Coursera learners' motivations and demographics. The remaining sections step through the planning and design workflow, covering recommendations for setting learning objectives, developing assessments and materials, and leveraging course community. Assessment design, video creation, and community building are explored in greater depth in separate Guides. For step-by-step technical instructions on setting up a new course, see [Course Creation \(/hc/en-us/articles/202429139-Course-Creation\)](/hc/en-us/articles/202429139-Course-Creation).

Designing for Coursera Learners

Designing for elective learners

Unlike traditional university students, Coursera learners are not taking required courses toward a degree. Instead, most learners elect to join courses that will advance their own personal or professional learning goals, and their decision to come back for the next lecture is motivated primarily by the value that they see in the course so far.

The following characteristics highlight important motivational differences between traditional students and Coursera learners:

Traditional university students Coursera learners

Choose a course to fulfill requirements for a degree program

Choose a course based on whether it promises to advance personal or professional learning objectives.

Have strong external (e.g., financial) incentives to attend and pass a course

Engage with a course only to the extent that it aligns with personal and professional goals

Have a primary commitment to studying

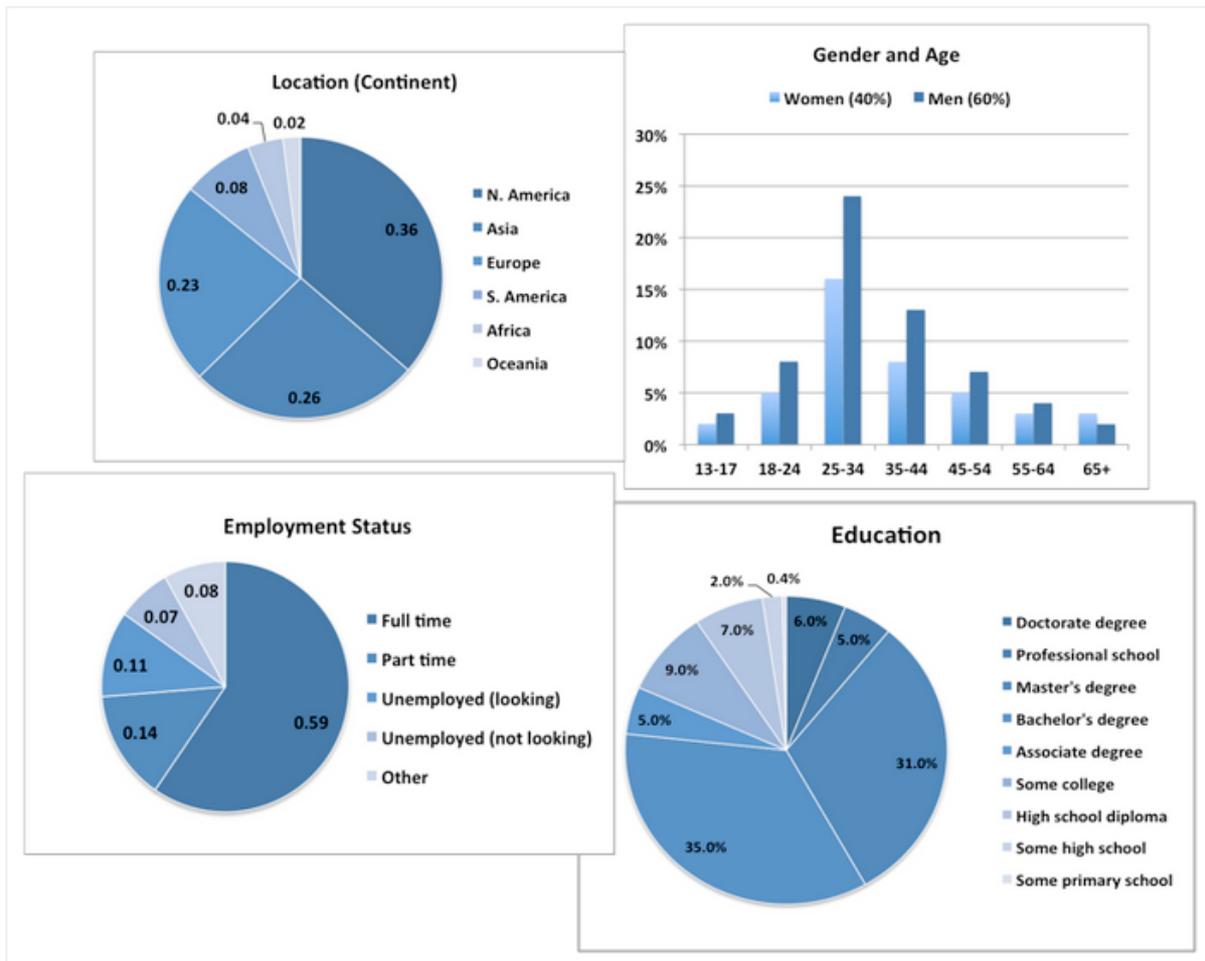
Find time for studying in a full life that includes work, family, and other obligations

Because their own motivations are based in concrete learning goals, Coursera learners are best served by courses that are designed with clear learning objectives in mind.

Similarly, because their primary goals are increased knowledge and improved skill, Coursera learners benefit from a course design that affords plenty of opportunities for practice, review, and constructive feedback. This *mastery learning* approach, introduced in this guide, is most often applied to assessments and is covered in more detail [Optimizing Assessments \(/hc/en-us/articles/203597939-Optimizing-Assessments\)](#).

Designing for diversity

Coursera learners come from a broad range of geographic, cultural, linguistic, and educational backgrounds. The figures below provide general demographic information for Coursera's learner community (note that these statistics reflect the subset of learners who have provided Coursera with demographic profiles).



The following table summarizes key demographic differences between Coursera learners and traditional university students:

Traditional university students

Coursera learners

Are typically young adults earning their first post-secondary degree

Represent a broad range of age groups, and have often already completed some level of post-secondary education

Are typically native or fluent speakers of the university's primary language of instruction

Represent a broad range of linguistic backgrounds and may not be fluent in the language of instruction

Clear and effective communication is essential to ensuring a good course experience for such a diverse community. When planning and designing the course, consider the following best practices to improve overall clarity:

Over-explain concepts and processes

Plan to present important topics in multiple formats (e.g., provide text notes and readings to supplement video lessons), and include alternative explanations and approaches in lesson outlines and video storyboards. Design projects and other open-ended assessments to be broken out into discrete, concrete steps that can be clearly articulated to learners.

Use simple language

When planning the course, identify any technical terms or advanced vocabulary that will be essential to explaining core concepts, and begin creating a course glossary for learner reference.

Highlight prerequisites

Does the course require that learners have certain background knowledge or skills? If so, identify these requirements and highlight them in the course description and other promotional materials. Compile a list of resources - including other Coursera courses - for learners seeking to brush up on prerequisites.

Learner diversity can be a great asset in a well-designed course. Instructors are encouraged to develop a variety of approaches to leveraging diversity in the context of their specific course and topic area; one popular approach is to incorporate ungraded activities (such as forum prompts and extra-credit peer assessments) that encourage learners to share personal stories, reasons for taking the course, and local context or relevant news items.

Curriculum Design Overview

Planning and design should begin with the articulation of learning objectives for the course as a whole. These high-level goals summarize the value of the course for learners, and define the concrete knowledge and skill outcomes that these learners typically look for in an online learning experience. Learning goals for each course unit and lesson will follow from the course-level objectives.

With learning objectives in place, assessments should be developed to support and evaluate learning of holistic concepts and individual lesson topics. Finally, video lessons and other resources can be designed to prepare learners for

assessments and to introduce advanced and tangential topics of interest. Throughout the process, instructional staff should consider opportunities to leverage the diversity and energy of the learner community.

The following sections explore the design of learning objectives, assessments, resources, and course community in more detail. Learning objective design is covered in the greatest depth; the remaining topics are explored in *Optimizing Assessments* (</hc/en-us/articles/203597939-Optimizing-Assessments>), *Producing Engaging Video Lectures* (</hc/en-us/articles/203525739-Creating-Engaging-Video-Lectures>), and *Building Course Community* (</hc/en-us/articles/203597949-Building-Course-Community>).

Defining Learning Objectives

Overview

Consider these general best practices when defining learning objectives for a new course:

Big goals first

Learning objectives should be defined first at the course level, then for each course unit, and finally for each individual lesson or video. Each unit or lesson goal should further one or more of the course-level goals.

Measurable and specific

Use specific, action-oriented verbs, and think about how learner success will be measured against the objective. For example, “Solve a simple linear equation” is a specific, action-oriented, and measurable objective; “Understand basic linear equations” is vague and difficult to measure.¹

Plan to communicate

Learners appreciate being presented with learning objectives at the beginning of a course, and before each lesson, to help them focus on key skills and concepts. Define objectives in simple, clear language, and avoid jargon or references to advanced topics.²

Defining course-level objectives

Course-level learning objectives help prospective learners see the value in a course, and provide motivation for continued engagement and focused study.

When defining course-level learning objectives, take a learner-centered approach by asking questions like, “How will a learner be different after completing this course?” Answers might include:

- Learners will be able to demonstrate knowledge in a field
- Learners will be able to apply new creative or technical skills
- Learners will appreciate a broader range of perspectives on an event or topic

Learner-centered objectives are best expressed in terms of specific action verbs and tasks.³ Use course-level objectives to communicate the value of the course by articulating concrete gains in knowledge and skill, and provide learners with a standard against which they can measure their progress (e.g., by asking “can I do this yet?”) throughout the course.

The table below provides several examples of how broad, vague objectives might be translated into specific objectives that articulate clear value to the learner. For more examples, visit the Carl Wieman Science Education Initiative Learning Goals page (http://cwsei.ubc.ca/resources/learn_goals.htm).

Original Objective Specific, Learner-Centered Objective

Learn how the physical and chemical attributes of the brain affect learning	Be able to list three techniques for better studying that are derived from physical and chemical attributes of the brain
Be able to write basic programs in the Python programming language.	Be able to write programs to solve problems which require: sequential execution (like a cooking recipe), repeated execution (like modelling an analog clock), and conditional execution (like checking if your password is correct).

Understand and solve problems with conditional probability	Identify situations and questions in which laws of conditional probability should be used and explain the impacts
Learn about common star constellations	Appreciate and enjoy stargazing through an understanding of how star constellations have been used throughout the ages and techniques for finding them in the night sky.

These examples illustrate the replacement of general verbs (“learn,” “understand”) with more specific action-oriented verbs (“identify,” “explain,” “write,” “appreciate”). The table below provides examples of verbs, grouped according to the level of cognitive understanding that they communicate, that may work well in learning objective definitions. For additional verb suggestions and supporting materials, visit this page (<http://teaching.uncc.edu/learning-resources/articles-books/best-practice/goals-objectives/writing-objectives>).

<u>Level of cognitive understanding</u>	<u>Description</u>	<u>Representative verbs</u>
Factual knowledge	Remember and recall factual information	Define, list, state, label, name
Comprehension	Demonstrate understanding of ideas and concepts	Describe, explain, summarize, interpret, illustrate
Application	Apply comprehension to unfamiliar situations	Apply, demonstrate, use, compute, solve, predict, construct, modify
Analysis	Break down concepts into parts	Compare, contrast, categorize, distinguish, identify, infer
Synthesis	Transform and combine ideas to create something new	Develop, create, propose, formulate, design, invent

Evaluation	Think critically about and defend a position	Judge, appraise, recommend, justify, defend, criticize, evaluate
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Levels of cognitive understanding and corresponding learning outcome verbs⁴

Defining module objectives

A course *module* usually corresponds to a single conceptual unit or about one week's worth of content. Clear and specific learning objectives for each module help learners visualize their learning trajectory and retain motivation as they progress through the course. As with course-level objectives, learners should be able to easily evaluate their individual progress against the module objectives.

When defining module objectives, consider the following checklist⁵:

- Does the learning goal identify what students will be able to do after the topic is covered? (e.g., Complete the sentence "After completing this module, you will be able to...")
- Is it clear how you would test achievement of the learning goal?
- Do chosen verbs have a clear meaning?
- Is the verb aligned with the level of cognitive understanding expected of students? Could you expect a higher level of understanding?
- Is the terminology familiar or common? If not, is knowing the terminology a goal?
- Is it possible to write the goal so it is relevant and useful to students (for example, connected to their everyday life), or does it represent a useful application of the ideas?

As with course-level objectives, module objectives benefit from careful selection of the most appropriate action-oriented verb. Refer to the table in the previous section for specific verb choice suggestions.

Once defined, the objectives for each module may be presented to learners in a video or text resource. Objectives may also be captured in the module title; module titles that allude to specific objectives tend to be more descriptive and compelling, as illustrated with the titles below:

Basic Module Title

Explicit, Descriptive and Inviting Module Title

Introduction to Academic
Writing

Academic Writing: What is it and Why is it Different?

Impromptu Speeches

How to Design, (Practice!), and Critique an
Impromptu Speech



When designing modules, estimate the time required for each. Divide objectives and content within each module into smaller chunks (lessons) that can be completed in 20-30 minutes. Coursera learners, who often fit coursework into small windows of free time, will benefit from this approach.

Designing Assessments

Both *formative* and *summative* assessments play an important role in learning.

- Formative assessments are low-stakes exercises that guide and support learning by allowing the learner to practice and receive feedback. Formative assessments leverage the assessment process as a learning tool; research has shown that retrieval of information in response to an assessment may deepen learning.⁶
- Summative assessments are higher-stakes assignments whose primary purpose is to measure the learner's progress relative to one or more learning objectives. Summative assessment performance is generally used to determine the learner's final grade.

In traditional university courses, assessment opportunities are limited by the time required for faculty to manually review and comment on student work.⁷ In an open online course, however, technology and crowdsourcing alleviate many of these time constraints. In particular:

- Most online assessments provide immediate feedback, which offers well-recognized benefits for the learner⁸; and
- Machine and peer-graded assessments reduce the time and effort required for staff evaluation of learner work to virtually zero. Because of this, online courses can include more frequent assessments, which

research suggests more effectively develop long term memory (a phenomenon called “the testing effect”).⁹

Thus, assessments may be leveraged for even greater learning impact in an online context.

The following short sections provide an introduction to the assessment planning and design process. For more in-depth guidelines, consult [Optimizing Assessments](#). ([/hc/en-us/articles/203597939-Optimizing-Assessments](#))

Creating an assessment plan

An assessment plan should articulate the number, type (see below), and placement of both formative and summative assessments throughout the course. When planning assessments, keep the following points in mind:

Assessments are grounded in learning objectives.

Each assessment should offer an opportunity to demonstrate achievement of one or more of the learning objectives for either an individual lesson, a unit or module, or the course as a whole. Map assessments to learning objectives at each level - for example, a final project might reflect course-level objectives, while a formative quiz could reflect lesson objectives.

Assessments promote mastery learning.

Educational psychologist Benjamin Bloom coined the term *mastery learning* to describe a structure in which “students are helped to master each learning unit before proceeding to a more advanced learning task”.¹⁰ Coursera learners have the flexibility to pursue mastery by re-engaging with learning resources until they are fully comfortable with a concept. Frequent formative assessment opportunities provide opportunities for these learners to benchmark their progress and confirm their mastery of each lesson before continuing.

Assessment types

The Coursera platform is designed to help instructors scale quality practice and feedback opportunities to thousands of learners through a range of automated and peer-reviewed assessment formats, including:

- In-video questions (lightweight, ungraded questions presented within a video lecture)
- Quizzes (supporting a range of question types including multiple choice, numerical response, and text response)
- Peer-graded assessments (open-ended assignments in which learners grade one another's work according to a rubric provided by the instructor)
- Programming assignments (machine-graded assignments that require learners to submit computer code)

In-video questions are designed to be used for formative purposes only. All other assessment types can support either formative or summative assessment.

Designing formative assessments

Formative assessments generally have the following characteristics:

- Presented to the learner as low-stakes opportunities for practice
- May show a score to the learner, but do not factor into the final course grade, and are not required for course completion
- Allow unlimited attempts
- Occur frequently throughout the course

Most formative assessments are short and focused on a single concept. However, they may sometimes be more extensive (e.g., a practice final exam).

When planning assessments, include some type of formative assessment for every distinct concept or lesson in the course. In-video quizzes offer a simple, lightweight format for integrating formative assessment in each lesson.



Aim for one formative assessment per 20-30 minutes of video content.

Designing summative assessments

Summative assessments generally have the following characteristics:

- Play a significant role in determining the learner's final grade, and are required for completion of the course

- May allow limited attempts, have a time limit, or impose a re-attempt delay
- Occur less frequently than formative assessments, and usually cover more material

Plan to include a summative assessment at the end of every major unit or module in the course. Consider leveraging peer-graded assessments or programming assignments for creative assignments or final projects.



Aim for one summative assessment per 1-2 hours of video content.

Designing Materials

With learning objectives and assessments in place, course content can be designed to support learners in succeeding in those assessments and achieving desired objectives.

Coursera course content can take a variety of forms, but all courses incorporate some form of video instruction. Research in multimedia learning, including studies conducted on Coursera's platform, offer guidance for instructors in creating effective and engaging video lessons; for more information, please see [Producing Engaging Video Lectures](#)

(https://docs.google.com/document/d/11pRxzpVL5R2OOnE7xSTWN44GkQjLt-D4s9WLAS_Sic0/edit?usp=sharing).

Course Community

Community interaction plays an extremely important role in open online courses. Thoughtful planning, guidelines, and incentives help to create a positive dynamic and position the learning community to quickly become self-sustaining, with peers answering one another's questions, organizing online and offline events, and enforcing conduct standards and course policies.

Set aside time in the course planning phase to consider the following community elements:

Forum structure

Course discussion forums are the main venue for learner interaction in a Coursera course. Design a forum structure that will keep conversations organized and productive; many instructors segment forums by course module or unit, and provide additional spaces for informal social discussions and feedback on the course. Also decide whether, and how often, a member of the course team will respond to questions in the forums.

Guidelines and policies

Coursera's Code of Conduct (<https://courserahelp.zendesk.com/hc/en-us/articles/201532585-Code-of-Conduct>) sets a basic standard for social behavior on the Coursera platform. Additional guidelines may be appropriate for some courses (e.g., those that address sensitive or controversial topics); consider whether a supplemental course-specific policy is necessary, and if so, how it will be communicated to learners.

For detailed recommendations on each of these elements, as well as additional resources on community management, consult the Building Course Community ([/hc/en-us/articles/203597949-Building-Course-Community](https://courserahelp.zendesk.com/hc/en-us/articles/203597949-Building-Course-Community)).

Summary and Next Steps

The most effective Coursera courses employ a thoughtful progression of formative and summative assessments, video lectures, and supplementary materials to support learners in attainment of clearly articulated learning objectives. These courses are specifically tailored to the unique needs of open online learners; they welcome a global audience, encourage mastery learning, and embrace design principles that guide and motivate learners to find time for studying in their otherwise busy lives.

Creating such a course requires plenty of advance planning and iteration, as well as a shift in mindset and approach from the needs of on-campus students and the format of a traditional classroom. Time invested in course design will pay off, however, in a smoother course creation process - and most importantly, in a profound benefit to thousands of learners around the world.

Instructors beginning the course design process are encouraged to browse existing Coursera courses for inspiration, and to learn more about Coursera's most successful learners by reading a few stories

(<http://blog.coursera.org/tagged/community>) on the Coursera blog (<http://blog.coursera.org/>). It may also be helpful to review other articles in the Guides section of this Help Center, or to visit the Coursera Partners' Portal (https://class.coursera.org/mooc/forum/list?forum_id=10030) to discuss ideas with other instructional teams.

Curriculum Design Checklist

Design for diverse elective learners

- Articulate and motivate specific, concrete learning objectives, emphasizing the real-world skills and applicable knowledge that learners will gain.
- Use clear, simple language in all communication. Define specialized terms, and provide multiple examples to clarify concepts and expectations.
- Integrate frequent opportunities for practice, review, and constructive feedback.
- Facilitate productive community engagement and peer-to-peer support by creating well-structured discussion forums and clear community guidelines.

Design for learning objectives

- First, define learning objectives for the course as a whole, followed by more specific module and lesson-level objectives.
- Next, design assessments to support progress toward learning objectives by facilitating practice (*formative* assessments) and to quantitatively measure learning outcomes (*summative* assessments).
- Finally, design video lectures and supplemental materials to prepare learners to successfully complete formative and summative assessments.

References

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